

# Railway Age Gazette

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE, BY THE  
SIMMONS-BOARDMAN PUBLISHING COMPANY,  
WOOLWORTH BUILDING, NEW YORK.

CHICAGO: Transportation Bldg. CLEVELAND: Citizens' Bldg.  
LONDON: Queen Anne's Chambers, Westminster.

E. A. SIMMONS, *President*.  
L. B. SHERMAN, *Vice-President*. HENRY LEE, *Sec'y & Treas.*  
The address of the company is the address of the officers.

## EDITORS.

ROY V. WRIGHT, *Managing Editor*.  
W. E. HOOPER  
B. B. ADAMS  
E. T. HOWSON  
SAMUEL O. DUNN, *Editor*.  
H. H. SIMMONS  
H. F. LANE  
E. A. AVERILL  
R. E. THAYER  
A. C. LOUDON  
E. S. FAUST  
F. W. KRAEGER  
A. D. CLOUD  
GEORGE L. FOWLER

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico.....	\$5.00
Canada.....	6.00
Foreign Countries (excepting daily editions).....	8.00
Single Copies.....	15 cents each

Engineering and Maintenance of Way Edition and four Maintenance of Way Convention Daily issues, North America, \$1.00; foreign, \$2.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

WE GUARANTEE, that of this issue 8,150 copies were printed; that of those 8,150 copies, 6,611 were mailed to regular paid subscribers and 345 were provided for counter and news companies' sales; that the total copies printed this year to date were 361,509—an average of 8,607 copies a week.

VOLUME 55.

OCTOBER 17, 1913.

NUMBER 16.

## CONTENTS

### EDITORIAL:

Editorial Notes.....	687
The Agitation for Government Ownership of Railways.....	688
Adjunctive Safeguards.....	689
*Missouri Pacific.....	689, 737
*Chicago, Rock Island & Pacific.....	691, 733
*Southern Railway.....	692, 729
New Books.....	694

### LETTERS TO THE EDITOR:

The Santa Fe Loss and Damage Committee; by H. G. Krake.....	694
---	-----

### MISCELLANEOUS:

The Flagging Rule and Its Enforcement.....	695
*Diesel Locomotive.....	697
*Renewing Two Double Track Swing Spans.....	699
Wartime Railroad in Mexico; by Major Charles Hine.....	702
*Record of a Lehigh Valley Locomotive.....	704
Railway Fire Protection Association.....	705
Conditions of Competition for the E. H. Harriman Memorial Gold Medal.....	708
*B. & O. Engine Terminal at Cumberland, Md.....	709
*Air Brake Hose; by J. S. Sheafe.....	711
*Small Motor-Driven Ventilating Sets for Buildings.....	712
*New Power Reverse Gear.....	713
Foreign Railway Notes.....	694, 698, 703, 711, 712, 713

### GENERAL NEWS SECTION.....

\*Illustrated.

THE stand taken by Governor Foss of Massachusetts in regard to the threatened strike of locomotive enginemen on the New Haven is, considering the governor's position before the public, as novel and refreshing as it is unexpected. The men are threatening to strike because the management of the railway has announced new rules making fitness the first qualification for the promotion of enginemen or their assignment to special runs. Governor Foss is a candidate for re-election. In the United States when a man is running for office he remains silent concerning controversies between railways and their employees or goes over bag and baggage to the employees. Governor Foss, on the contrary, has come out flatly against a strike on the ground that the public welfare is entitled to the first consideration, and that from the standpoint of the public the pro-

posed strike would not be justifiable. Governor Foss has shown that he is an astute politician, and the position he has assumed may be as significant of a changing public opinion as it is creditable to him. It seems quite possible that his course may be, in some measure, attributable to a belief on his part that the public is growing less patient with such labor union unreasonableness as is now being exhibited in New England. At any rate, it would appear that it can be but a matter of time until the public will be brought to realize that the truly faithful public servant is the one who will oppose the unreasonable demands of organized labor just as vigorously and courageously as he will oppose the unreasonable conduct of organized capital.

THE retirement of Major Hine as vice-president of the Southern Pacific Lines in Mexico and of the Arizona Eastern to return to the field of expert railway work marks the complete severance of his connection with what were formerly the Harriman Lines. Doubtless his retirement is largely due to the unsettled conditions in Mexico, which so seriously interfere with satisfactory railway operation in that country. Major Hine's work in connection with the adoption of the Hine unit system on the Harriman Lines has become famous throughout the world of railroading. The Hine system of organization has not received as wide and permanent adoption as its originator probably hoped for; but his labors have, nevertheless, been fruitful. They have caused great attention to be directed toward the subject of railway organization—a matter to which not enough attention had been given. Many railway organizations had “just growed”; and it was impossible that railway managers should begin to analyze them without detecting many of their defects and weaknesses. In consequence, since Major Hine began his work on the Harriman Lines, there have been changes in the organizations, not only of those lines, but of many others; and in numerous cases they have been similar in nature, although not in outward form, to those Major Hine has advocated. It is perhaps fortunate for the railways that Major Hine has returned to the expert field; for there is need for men who have both his theoretical and practical equipment constantly to direct the attention of railway managements toward various phases of organization and efficiency. While practical railway men always have a tendency to stamp as “theorists” those who want to change things around, they can hardly help listening with respect to one who not only has a stock of theories and principles to advance and defend, but who is prepared to back them up with an experience gained as brakeman, switchman, conductor, yardmaster, trainmaster, general superintendent, general manager and vice-president; and while few persons greatly relish criticism of the way they do things, all persons who are worth striving with are benefited by receiving criticism from intelligent sources.

THE appointment of Louis D. Brandeis of Boston as attorney for the Interstate Commerce Commission in the pending eastern rate advance case is not the least significant development in connection with this most recent demand of the eastern lines that they be allowed to earn more revenue. When the railways of both the East and West sought three years ago to advance their rates they encountered determined and organized opposition from the shippers. No similar opposition has been offered to the present movement of the eastern lines for a general advance of 5 per cent. It had begun to look as if there would be practically no opposition. Nobody has been authorized, apparently, to state what is the commission's motive in appointing Mr. Brandeis. It seems quite probable, however, that the commission felt that in spite of the lack of concerted opposition on the part of the shippers, a general advance in rates should not be authorized without a real investigation of its merits, and that it appointed Mr. Brandeis to the role of an inquisitor of the witnesses for the railways to make sure that all the pertinent facts would be brought out. If this surmise be correct, neither the commission's action in appointing an attorney, nor its selec-

tion of Mr. Brandeis, can justly be criticized. All of the pertinent facts, whether adverse or favorable to the railways, ought to be laid before the commission before it reaches its decision, and no better-equipped man to bring out those adverse to the railways could have been chosen than Mr. Brandeis. Past experience indicates that Mr. Brandeis may resort to the methods of sensationalism and the muckraker as well as to those of the lawyer. But railway counsel and managers must recognize that if they are effectively to defend the properties they represent they must be prepared to meet attacks on them of all kinds and with all manner of weapons. If the case of all the railways, or any of them, is vulnerable, that is the fault of their managements; and if it is not vulnerable they can defend it against one kind of attack as well as another if they are fit for their jobs.

#### THE AGITATION FOR GOVERNMENT OWNERSHIP OF RAILWAYS.

FOR some months *Pearson's Magazine*, whose chief boast is that it publishes articles no other magazine will print, has been running a series by Charles Edward Russell, advocating government ownership of the railways of the United States. In its October issue *Hearst's Magazine* begins a series by Alfred Henry Lewis, also advocating government ownership of railways. Mr. Lewis has not heretofore been known as an expert on railway matters. His most recent claim to distinction is that he acted as publicity agent for Harry Thaw in his campaign for release from the Matteawan insane asylum; and he writes according to the accepted muckraking formula, which consists of nine parts slab-dash and one part glitter. "The railroads (of the United States) by light of last year's figures are," he says, "killing 712 and wounding 15,996 people a year." These figures are very much smaller than the correct figures for the total fatalities and injuries in the fiscal year 1912, and are not the correct figures for any particular class or classes of railway accidents. Continuing, Mr. Lewis contrasts the accident statistics of the railways of the United States with those of the railways of France. It is true that the French railways are remarkably safe, but no advocate of government ownership who knew anything about his subject would mention their accident statistics. The excellent record of the French railways as a whole is due entirely to the exceptional safety of the private railways; for the State railways of France are the most unsafe lines in any leading country in the world. The French private railways have a mileage of 19,610 miles; the French State railways have a mileage of only 5,546 miles. Nevertheless, in the year ended June 30, 1910, while the private railways killed only 5 passengers in train accidents, the State railways killed 66. For every 10,000,000,000 passengers carried one mile the private railways killed 6, while for every 10,000,000,000 passengers carried one mile the State railways killed 315, or 53 times as many. Obviously, the accident record of the French railways is an argument against, not for, state ownership! For every 10,000,000,000 passengers carried one mile the railways of the United States in the year ended June 30, 1911, killed only 107 in train accidents, so that their record in this respect was only one-third as bad as that of the French State railways.

In another place Mr. Lewis, after having mentioned the land grants made to the railways of the United States, says, "Not a railroad of them all ever offered one of those acres for less than \$2.50." Now, the truth is that a large part of the land given to the railways was not only offered, but sold by them, for less than \$2.50 an acre. For example, the land donated to the Union Pacific in what is now the state of Wyoming included a 400-foot strip through the state for 445 miles, or approximately 22,196 acres, and 5,000,000 acres elsewhere. The government price for land in Wyoming at that time was \$1.25, but the Union Pacific sold over 70 per cent. of its grant in Wyoming for from 44 cents to \$1.25 per acre. It underbid the government in selling land because it

was anxious to develop the country along its line and thereby increase its traffic.

The accuracy of the rest of Mr. Lewis' statements may be judged from that of those mentioned. The bulk of his article is devoted to showing how Collis P. Huntington is alleged to have purchased public men, and especially members of Congress, in order to make and keep them friendly to his railway projects. The data given relate to occurrences prior to 1880, or more than 30 years ago. What railway men were doing then no more indicates what they are doing now than what public men were doing then indicates what they are doing now. Therefore, if Mr. Lewis' evidence in regard to what Mr. Huntington was doing over 30 years ago shows, as he says, the character and methods of the present generation of railway managers, it also shows the character and methods of the public men and members of Congress of the present generation. In other words, if it shows that the railway managements of today are bribers of public men, it also shows that the public men of today are bribe-takers, and that those who advocate government ownership are advocating turning the management of the railways over to public men who are corruptionists and blackmailers. Just how it can be assumed that this would improve matters, does not appear entirely clear.

While it is easy for any one familiar with railway affairs to tear to shreds the articles of such men as Russell and Lewis, it does not follow that their writings can safely be ignored. The people whom they reach know little about railway matters and are not aware of how ignorant or dishonest Lewis and Russell are. Therefore, many persons are bound to be misled by them. What is worse, Lewis and Russell are far from being the only people who are producing literature of this character. Every day hundreds of thousands, and even millions, of pieces of literature attacking, not merely private ownership of railways, but private property of all kinds, are being distributed throughout the United States. Some of this originates with persons who are avowed socialists. Much of it originates with persons who are socialists without knowing it. The purpose of it all is to revolutionize the industrial and economic system and the form of government of this country. The railways are properly regarded by Mr. Russell and similar propagandists as merely the first outpost which must be taken in the campaign for the establishment of a socialistic state. Once government ownership of railways was adopted they would begin with redoubled energy to fight for the socialization of all means of production, distribution and exchange. Bismarck thought that by nationalizing the railways of Germany and adopting various other socialistic measures he could check the rising tide of socialism. The results have shown he was mistaken. The Socialist party in Germany has continued to grow, and under manhood suffrage it might soon triumph.

It is not merely property in railways that is under attack in the United States. It is the right of private property in anything. It is but a few years since the single tax doctrine was an object of ridicule. Today it has many thousands of supporters. In other words, the attack on private property in land as well as the attack on private property in railways is making progress. While many are attacking private property, few are defending it. The reason is that few are awake to the situation that is developing. While the stupid poor are being misled by people like Russell and Lewis, the stupid rich are doing many things that bring private property into disrepute and almost nothing to defend it. If the manufacturers, the bankers, the mine operators and the farmers of the United States realized whither we are drifting they would be co-operating with the railways in carrying on a campaign for fair regulation of railways and against government ownership of railways. But throughout history the stupidity of the "have nots" has been equalled only by the stupidity of the "haves." And so this flood of socialistic literature which is being poured forth continues to be largely unanswered.

### ADJUNCTIVE SAFEGUARDS.

IT is to be admitted that "adjunctive" is not a pleasant sounding word; but it is entitled to a good reputation, for in the Standard Code "adjuncts" occupy a prominent place. In the rules for manual block signaling, so important a feature as the distant signal is put down as an adjunct, which *may* be used. In automatic block signaling track circuits are likewise classed as optional! In interlocking, these and a dozen other things are made optional, and classed as adjuncts. There are, however, two important adjuncts, of another class, concerning which the Standard Code is not so explicit; (a) the fireman's lookout for fixed signals, as an adjunct to the engineman's lookout, and (b) the flagman's function as a preventer of rear collisions, in which function his office is that of an adjunct to the block signal system. These adjuncts are just now the subjects of much discussion. Both of them proved useless on the New Haven road September 2, when 21 passengers were killed.

The weakness of the rule which requires enginemen and firemen to call the signals to each other as they approach the signal location was here well illustrated. The rule is weak, at best, for there is no satisfactory way of checking the men's obedience to it, and it is hard to hold either man to the duty of calling first; but in running through fog the likelihood of disobedience probably is stronger than in clear weather, for a fireman can very naturally assume that in fog the engineman is forced to be particularly alert every moment; is least likely to miss anything and least in need of a monitor. And, the view being short, the fireman has not so good a chance to see signals at the right hand side of the track. At North Haven the grade was easy and the firemen's work was not specially hard, and yet he did not detect, or at all events did not check, the excessive speed. It is clear that if the fireman's monitorship is to be a satisfactory safeguard on fast trains he must not only see signals after the engineman sees them, but must also be on the lookout for them independently. If a signal is visible for only a few hundred feet there are but a few seconds in which to see it. This collision again emphasizes the lesson, which has been made plain enough on many former occasions, that this monitorship rule should be made stronger (if that is practicable) or else that some other safety measure should be adopted in the place of it. Every failure of this kind serves to push the railroad world farther along toward the position where a majority will declare that automatic train stops are our only hope.

At North Haven the flagman also failed. It would be easy to formulate an argument that the flagman's failure was the worst feature of the case; that to cure his fault is the first duty of the day. Mr. Belnap places this first in his statement of causes. Many branch lines and other lines of thin traffic are still without block signals, and on these flagging is a vital feature. Because of this, and of lifelong habits of mind, enginemen and other trainmen everywhere think of flagging as the most critical feature of the code of rules, and officers are all the time working to impress this view. Because of the difficulty of enforcing the flagging rule it has received more than its proportion of attention.

But, notwithstanding these circumstances, flagging is, on block signaled lines, an adjunct. The block signals are the main thing. In the early days of block signaling, there was a general attempt to maintain the time interval as the chief protection and to treat the block signal as secondary, but everybody was forced to abandon that notion, for the logic of everyday experience constantly showed its absurdity.

And now flagging is secondary. Block signals are not perfect (and it may be admitted that they could not be made absolutely perfect by adding automatic train stops) and so the spectacle of the officer urging the flagman to do his duty is as familiar today as it was when block signals were unknown. But the perplexities are as great as ever. What can be done?

In an article in another column the difficulties connected with flagging are recounted somewhat at length; not with the idea

that these difficulties are not already known, but because they have never been adequately formulated. This is a great lack. This article does not attempt to meet this lack, but it is hoped that it will serve to point out some of the facts which indicate the need of meeting it. A really satisfactory treatment of the subject would mean a task for a strong committee of the American Association of Railroad Superintendents.

The crucial difficulty with flagging is that the rule constantly calls for delicate judgments on the part of men whose selection, training and pay are not of a kind to furnish the mental and moral character necessary to form delicate judgments on the spur of the moment. The surgeon, who must decide quickly one or more questions on which may hinge a man's life, has had several years' systematic and constant training; we require the flagman to decide questions which potentially are of equal importance, or even greater, when he has had only unsystematic and fragmentary training. The great inconsistency of this feature of railroad operation is that this delicacy of the flagman's function is admitted, while yet we do not take thorough measures to fit him for his work. The fault of the flagman and the engineman, in depending each too much on the other, is repeated in the superintendent's office. Assume that the desideratum is a factor of safety of two. The block system, without the flagman, is, let us say, 99 per cent. perfect (it is, undoubtedly, much more than that); the flagman even in his present inefficiency, takes adequate measures to protect his train, let us say, in 99 per cent. of cases. These two protective measures overlapping, we imagine we have 198 per cent. of safety; so nearly a factor of two that we let it go at that. This little computation is only a mathematical false-work; but does it not truly illustrate the character of some of our thinking? The point which seems to be forgotten is that not 198 per cent., nor even 199.99 is satisfactory.

Nor can we say that the public, educated, as the public is, by the sensational and superficial daily press, is wholly unreasonable. It demands all sorts of impossible things, and the railroad director has, indeed, a task to try to lead people and legislators to take reasonable views; but the operating officer, grappling at short range with this problem, is bound to aim at 200 regardless of the public. He desires the same himself. The only difference that should exist between him and the ignorant or hysterical spokesmen of the public is that the measures taken by him must be always rational and progressive. And it will be admitted that the present flagging practice cannot be classed as either rational or progressive.

### MISSOURI PACIFIC.

A COMPARISON of the income accounts of the Missouri Pacific system for 1911, 1912 and 1913 borders on the romance of railroading. Total operating revenues in 1911 were \$52,777,000; in 1912, \$54,503,000, an increase of 3.27 per cent.; and in 1913, \$62,156,000, a further increase of 14.04 per cent. over 1912. Operating expenses in 1911 were \$43,330,000; in 1912, \$41,281,000, a decrease of 4.73 per cent.; and in 1913, \$44,700,000 an increase of 8.28 per cent., of which \$3,418,000 increase in 1913, \$2,127,000 was in maintenance. The net corporate loss in 1911 was \$5,233,000; in 1912, \$1,979,000, and had been turned into a net corporate *income* of \$1,563,000 in 1913.

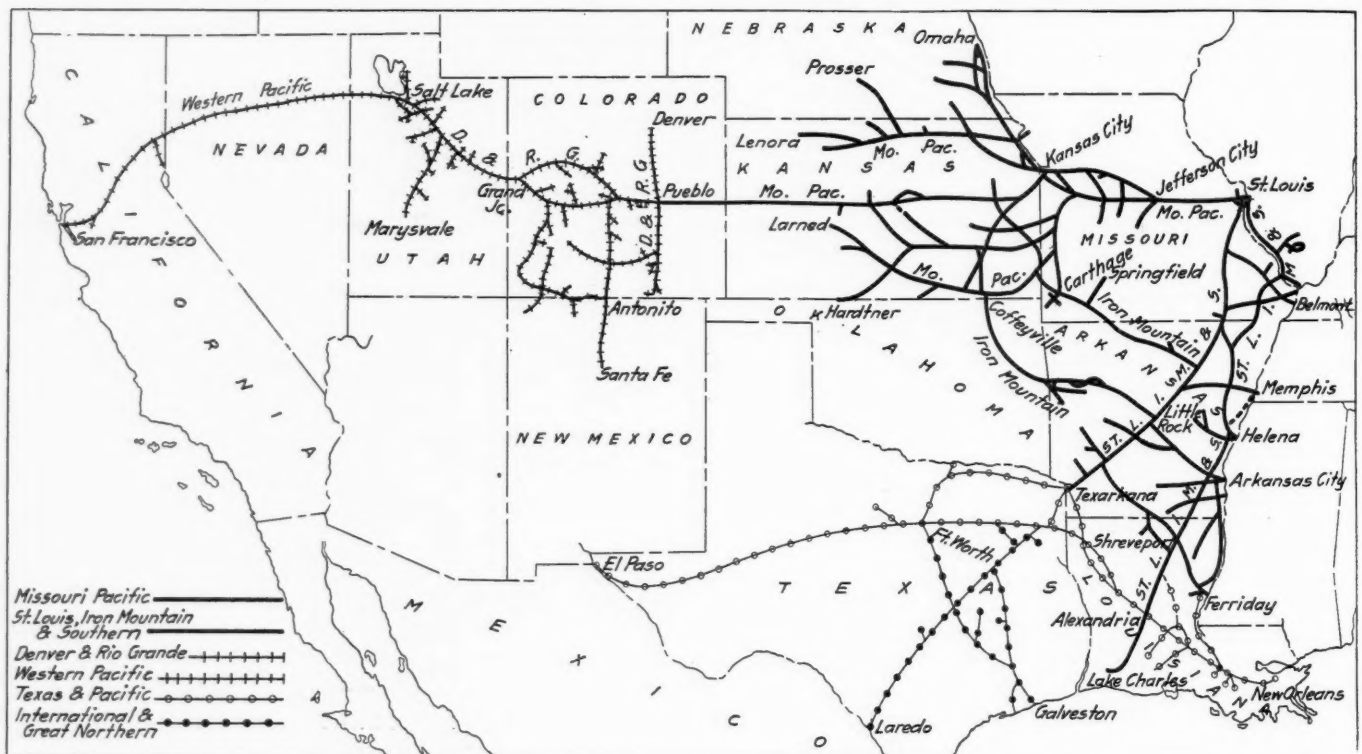
Freight traffic density in 1911 was 607,000 tons; in 1912, 663,000 tons, an increase of 9.21 per cent.; and in 1913, 781,000 tons, an increase of 17.80 per cent. over 1912. President Bush refers to this fact in pointing out the necessity of further additions and betterments, for which the company must pay by the issue of capital securities; and interesting and convincing as it is in this connection, it is also a remarkable commentary on the gain that has already been made in the effective operation of the present plant. The average mileage operated in 1911 in the Missouri Pacific system, which includes the St. Louis, Iron Mountain & Southern, was 7,235 miles, and in 1913 was slightly greater—7,257 miles. The company divides this mileage as between branch line

and main line mileage, classifying about 4,700 miles as main line and about 2,300 miles as branch line. Of the total mileage in 1911, 31.48 per cent. was entirely unballasted and 29.40 per cent. was ballasted with gravel. Of the total in 1911, 34.19 per cent. was laid with 56-lb. rail, and but 30.67 per cent. with 85-lb. rail. In 1913 30.23 per cent. of all tracks was unballasted and 25.38 per cent. was ballasted with gravel, the change from gravel being to either cinders and slag or chatts. In 1913 31.55 per cent. of all tracks was laid with 56-lb. rail or lighter, and 33.67 per cent. with 85-lb. rail. During the past two years the company has spent \$8,326,000 for additions and betterments, and it can easily be seen what tremendous expenditures will still have to be made to bring the property up to the standard of such a road as the Union Pacific. The point is, however, that in these two years the management has been successfully engaged in demonstrating that the property was worth spending money on for additions and betterments.

If it is possible under the proper management to change a net loss, after the payment of interest charges, of over \$5,000,000 into a surplus of more than \$1,500,000, after paying the interest

best. In St. Louis especially, and to a nearly equal extent in Kansas City, the M. P. has facilities for getting the very cream of the freight business. Of the total tonnage, amounting to 23,310,000 tons, carried in 1913, 36.2 per cent. was products of mines, 21.9 per cent. products of forests, 17.3 per cent. products of agriculture, 13.5 per cent. manufactures, 5.1 per cent. merchandise, and 4.2 per cent. livestock and animal products. The increase in tonnage, which amounted to 3,171,000, or 15.7 per cent., was greatest in agriculture and in lumber and forest products, but was general in all classes of commodities, the increase in products of agriculture amounting to 22.7 per cent.; products of forests, 20 per cent.; products of mines, 18.8 per cent.; manufactures, 8.8 per cent.; and in livestock and animal products, 8.1 per cent.

The revenue train load in 1911 was 291 tons; in 1912, 333 tons; and in 1913, 373 tons. Carloading in 1911 per loaded car was 16.22 tons; in 1912, 16.90 tons; and in 1913, 18.06 tons. While passengers carried one mile increased 8.42 per cent. in 1913 and totaled 502,100,000, and revenue freight ton miles increased 18.23 per cent. and totaled 5,668,400,000, passenger train miles in-



The Missouri Pacific and Its Gould Connections.

on the \$8,000,000 spent for betterments, although not conclusive proof in itself that further very heavy expenditures will be justified, it is strong evidence to this effect. While, of course, the best friends of the Missouri Pacific would acknowledge that its operating efficiency at the time the present management took hold of it was low, the gain that has been made since is probably better than even the most optimistic of these friends would have hoped for.

The amount of gross business that may be secured by the Missouri Pacific depends to a larger extent than on almost any other road in the country, on the ability of the company to expeditiously handle the traffic. The Missouri Pacific system has a north and south line in the Mississippi valley corresponding on the right shore south of Cairo, Ill., with the Illinois Central on the left shore, and has as feeders from the southwest the International & Great Northern and the Texas & Pacific. It has in its main line from St. Louis via Kansas City to Pueblo, Col., an effective instrument for competition with the Union Pacific on transcontinental business, and the facilities in St. Louis, Kansas City, Omaha, St. Joseph, Memphis, etc., are of the

increased but 6.13 per cent., totaling 12,547,000, and freight train miles increased but 5.78 per cent., totaling 14,197,000 miles.

The following table shows the ratio of each class of expenses to total operating revenues:

	1913.	1912.
Maintenance of way and structures.....	14.90	15.90
Maintenance of equipment.....	15.86	15.27
Traffic expenses .....	2.29	2.49
Transportation expenses .....	36.25	39.02
General expenses .....	2.61	3.06
Total .....	71.91	75.74

There is no general combined balance sheet for both the Missouri Pacific and the St. Louis, Iron Mountain & Southern given in the annual report; but it is evident that one or both of the companies will in the not distant future have to come in the market for additional capital. Cash in the Missouri Pacific treasury amounted to \$503,000 at the end of 1913, as compared with \$1,478,000 at the beginning of the year; and to \$641,000 in the treasury of the St. Louis, Iron Mountain & Southern at the end of the year, as compared with \$826,000 at the beginning of the year. It is proper to point out, however, that at the end

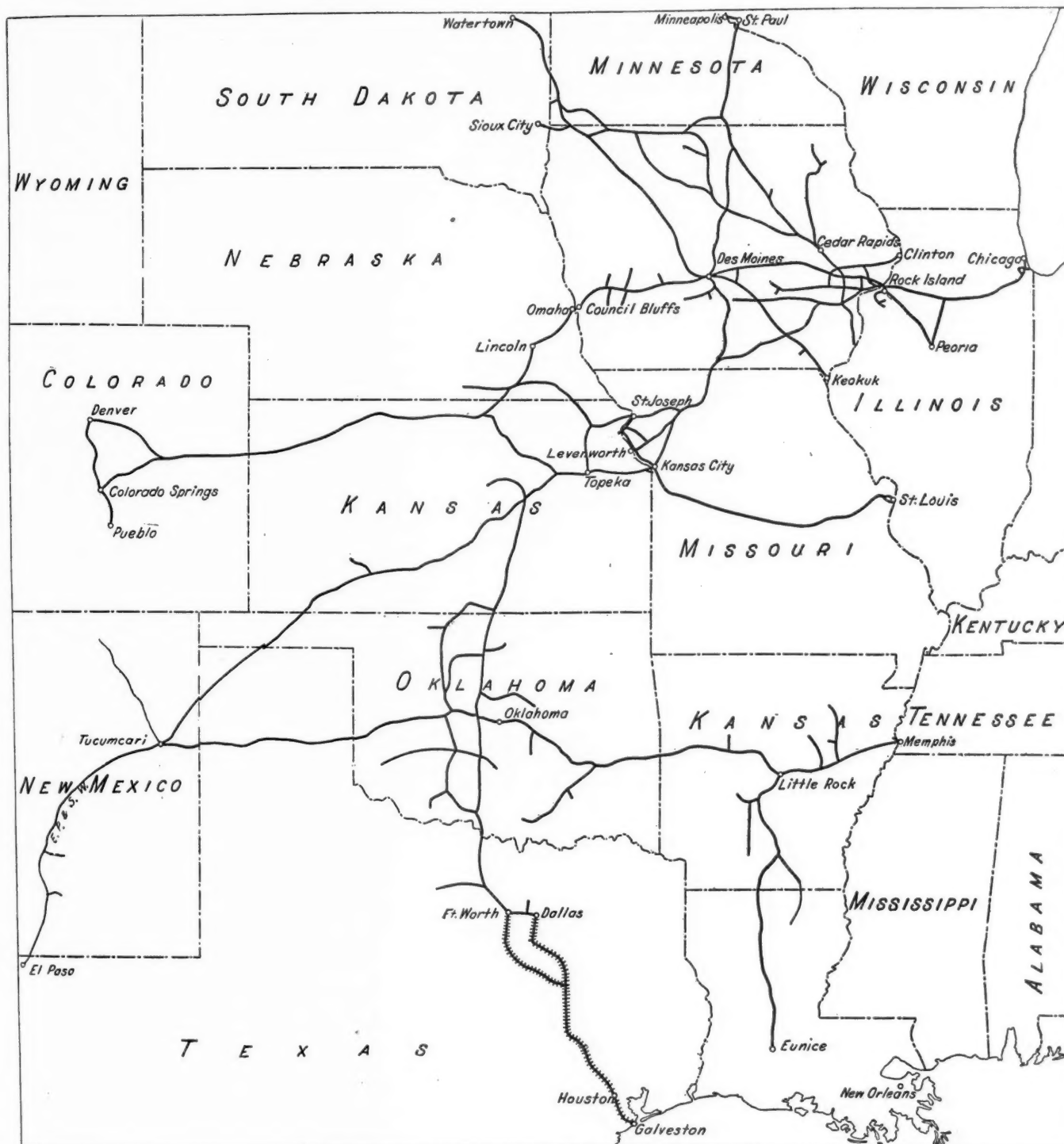
of the year there was no floating indebtedness, except, of course, current vouchers, etc., outstanding for either company.

The following table shows the principal figures for operation in 1913 as compared with 1912:

	1913.	1912.
Average mileage operated.....	7,257	7,231
Freight revenue .....	\$45,748,269	\$39,514,356
Passenger revenue .....	11,627,481	10,662,443
Total operating revenues.....	62,155,506	54,503,250

#### CHICAGO, ROCK ISLAND & PACIFIC.

THE operating management of the Chicago, Rock Island & Pacific labor under a difficulty peculiar to this company alone of all the roads in the United States and one for which they are of course in no way responsible. The C. R. I. & P. Railway (the owning and operating company) is not very heavily capitalized; but not only is its mortgage debt more than



The Chicago, Rock Island & Pacific.

Maint. of way and structures.....	9,263,360	8,664,769
Maint. of equipment.....	9,860,188	8,321,787
Traffic expenses .....	1,425,168	1,358,014
Transportation expenses.....	22,528,447	21,268,314
General expenses.....	1,621,834	1,667,708
Total operating expenses.....	44,698,997	41,280,592
Taxes .....	2,314,349	2,218,018
Operating income .....	15,049,156	10,883,787
Gross income .....	17,512,755	13,130,432
Net income .....	1,562,734	1,979,091*

\*Deficit.

twice its outstanding stock, but the dividend requirements of 5 per cent. on the outstanding \$75,000,000 stock amount almost, if not quite, to a fixed\* charge.

\*The Chicago, Rock Island & Pacific Railway Company stock is deposited as collateral under Chicago, Rock Island & Pacific Railroad bonds, and 5 per cent. on the Railway stock amounts to but little more than the interest charges on the Railroad bonds. Control by the Rock Island Company of the C. R. I. & P. is dependent upon the payment of interest charges on the Railroad bonds without default.

This leaves the management where it can adjust outgo to income only by varying maintenance charges to meet falling off in earnings. Conversely, when the earnings increase, prudence compels heavy increases in maintenance charges.

This latter was the case in the fiscal year ended June 30, 1913. Total operating revenues amounted to \$71,365,000, an increase over 1912 of \$6,652,000, or more than 10 per cent.; and operating expenses were \$52,504,000 in 1913, an increase of \$5,745,000, or 12 per cent., of which increase, however, \$3,162,000 was in maintenance charges and but \$2,562,000 in transportation expenses. The handicap which is placed on the operating management by such an indefensible financial arrangement as that of the Rock Island's makes an economical operation of the property peculiarly difficult, and gains in operating efficiency are, therefore, all the more creditable.

In 1913 the Chicago, Rock Island & Pacific carried 21,102,000 tons of revenue freight, an increase over 1912 of 11.24 per cent., with 16,762,000 freight train miles, an increase over 1912 of 5.90 per cent.; and carried 19,413,000 passengers, or 2.57 per cent. more than in 1912, with 18,775,000 passenger train miles, an increase of 2.26 per cent. The average haul of freight in 1913 was 247 miles, or 4.15 per cent. longer than in 1912, and the average passenger journey was about 50 miles, or only slightly more than in 1912. The average revenue train load of freight was 297 tons in 1913 and 278 tons in 1912. This is a gain in train loading of nearly 7 per cent. in the one year, while the total gain in train loading in the last five years has been only about 12 per cent.

The Rock Island's train load is not very heavy when we consider that more than 30 per cent. of its total tonnage is furnished by products of mines. On the other hand, 27 per cent. last year of its total tonnage was furnished by grain and other products of agriculture, which, of course, do not permit of very heavy loading, and necessitate a large empty car mileage which acts to bring down the average train load. The larger train load in 1913 was the result both of better car loading—15.79 tons per loaded car in 1913 and 15.11 tons in 1912—and the elimination of some empty car mileage—the number of empty cars per train in 1913 being 7.07, and in 1912, 7.25.

In addition to the handicap of the rigidity of dividend requirements, there is the great physical difficulty of operating such a system as the Rock Island. It is sprawled out over 14 states. There are all sorts of conditions; lines from Chicago to Minneapolis and to Kansas City have to meet very severe competition, while the branch lines in Oklahoma, Arkansas and Louisiana have hard work to get traffic enough to support them; and to add to the difficulties of operation, a good many of the branch lines, while in as good physical condition as present traffic justifies, are laid with light rails and have little or no ballast. It is not surprising, therefore, that the average train load is small, and even a small increase in the average reflects probably the result of a great deal of effort and time on the part of the management. On a system where conditions are so diversified as on the Rock Island, if the general superintendent of one district succeeds in getting more effective work out of his organization and a resulting better train load, it is likely that the general superintendent of one of the other districts will have some adverse conditions which are beyond his control which will lower his train load and thus offset in the total average the gain in efficiency made on the other district.

The contention that increases in business will offset higher wages, higher cost of fuel and other material is not borne out by a comparison of the Rock Island figures for 1909 and 1913. If we take the average train load in 1909 of freight and the average number of passenger per train, and work out an equivalent for total ton mileage so as to get a basis of comparison of work done, we find that total transportation expenses in 1909 per unit\*

\*In 1909 the average train load was 265 tons and the average number of passengers per train mile 58. A passenger mile is, therefore, taken as the equivalent of 4.6 ton miles, and this ratio is used to translate passenger miles into ton miles in 1913.

were 2.7 mills as against 3 mills in 1913. This is an increase in transportation costs per unit of work done of 11 per cent., despite an increase in revenue train load of 12 per cent. The unit used would reflect a saving either in freight train loading or in increased passengers per train mile. There was, however, a decrease in the number of passengers per train mile of 8 per cent. In 1909 transportation expenses per train mile of total train miles was 68.8 cents, and in 1913, 76.7 cents, an increase of more than 11 per cent.

The following table shows the ratio of each class of expenses total operating revenues for the years 1913 and 1912, and emphasizes the point previously mentioned that the increase in expenses this year is largely due to the fact that the company had more money to spend on maintenance, and spent it.

	1913.	1912.
Maintenance of way.....	13.85	13.13
Maintenance of equipment.....	14.11	12.83
Traffic expenses.....	2.80	3.06
Transportation expenses.....	40.32	40.50
General expenses.....	2.49	2.74
Total.....	73.57	72.26

When the Chicago, Rock Island & Pacific sold its \$20,000,000 debentures in January, 1912, the company agreed to sell no more first and refunding bonds until January 1, 1914. During the past year \$9,538,000 was spent for additions and betterments and for additional equipment. There was issued \$3,480,000 net bonds, which are held in the company's treasury, and \$3,146,000 net equipment trust notes, which were sold, making a total increase of securities in the hands of the public of \$3,146,000 and \$4,476,000 securities issued held in the treasury. At the beginning of the year the company had \$15,074,000 cash, and drew on this to pay for additions and betterments, leaving at the end of the year \$5,120,000; but had \$6,667,000 audited vouchers and wages unpaid, as compared with \$3,704,000 unpaid at the end of 1913. It is understood that since the close of the year the amount of outstanding audited vouchers, etc., has been materially reduced; but since the company has issued no new securities and cannot issue any until the first of January, 1914, it has presumably had to draw on surplus earnings and cash to liquidate these accounts.

The following table shows the principle figures for operation in 1913 as compared with 1912:

	1913.	1912.
Average mileage operated.....	8,048	8,036
Freight revenue.....	\$46,428,045	\$41,156,835
Passenger revenue.....	19,777,431	18,609,408
Total operating revenues.....	71,364,935	64,712,853
Maint. of way and structures....	9,885,324	8,493,346
Maint. of equipment.....	10,072,854	8,302,467
Traffic expenses.....	1,999,138	1,981,399
Transportation expenses.....	28,772,587	26,210,502
General expenses.....	1,774,199	1,771,780
Total operating expenses.....	52,504,102	46,759,494
Taxes.....	2,946,438	2,793,315
Operating income.....	15,914,395	15,160,044
Total income.....	16,944,190	15,887,289
Net income.....	4,058,355	3,850,396
Dividends.....	3,743,525	3,743,760
Surplus.....	314,830	106,636

#### SOUTHERN RAILWAY.

THE Southern Railway's annual report for the fiscal year ended June 30, 1913, is full of Mr. Finley's belief in the South, his pride in what the country is doing and his appreciation of what the officers of the Southern Railway are doing to aid in this development. While it is true that the great development of the southeastern states in the last five or six years is in considerable part a monument to Mr. Finley and the Southern Railway, railroad men and investors will find in a study of what has been accomplished on the Southern Railway itself a record of achievement that is intensely interesting.

The table at the end of these remarks shows in some detail the results of operation in 1913 as compared with 1912, from which table it will be seen that after paying the full 5 per cent. interest on the preferred stock in 1913 as against 4½ per cent. in 1912, and despite spending 18 per cent. more for maintenance of way and 12 per cent. more for maintenance of equipment, the

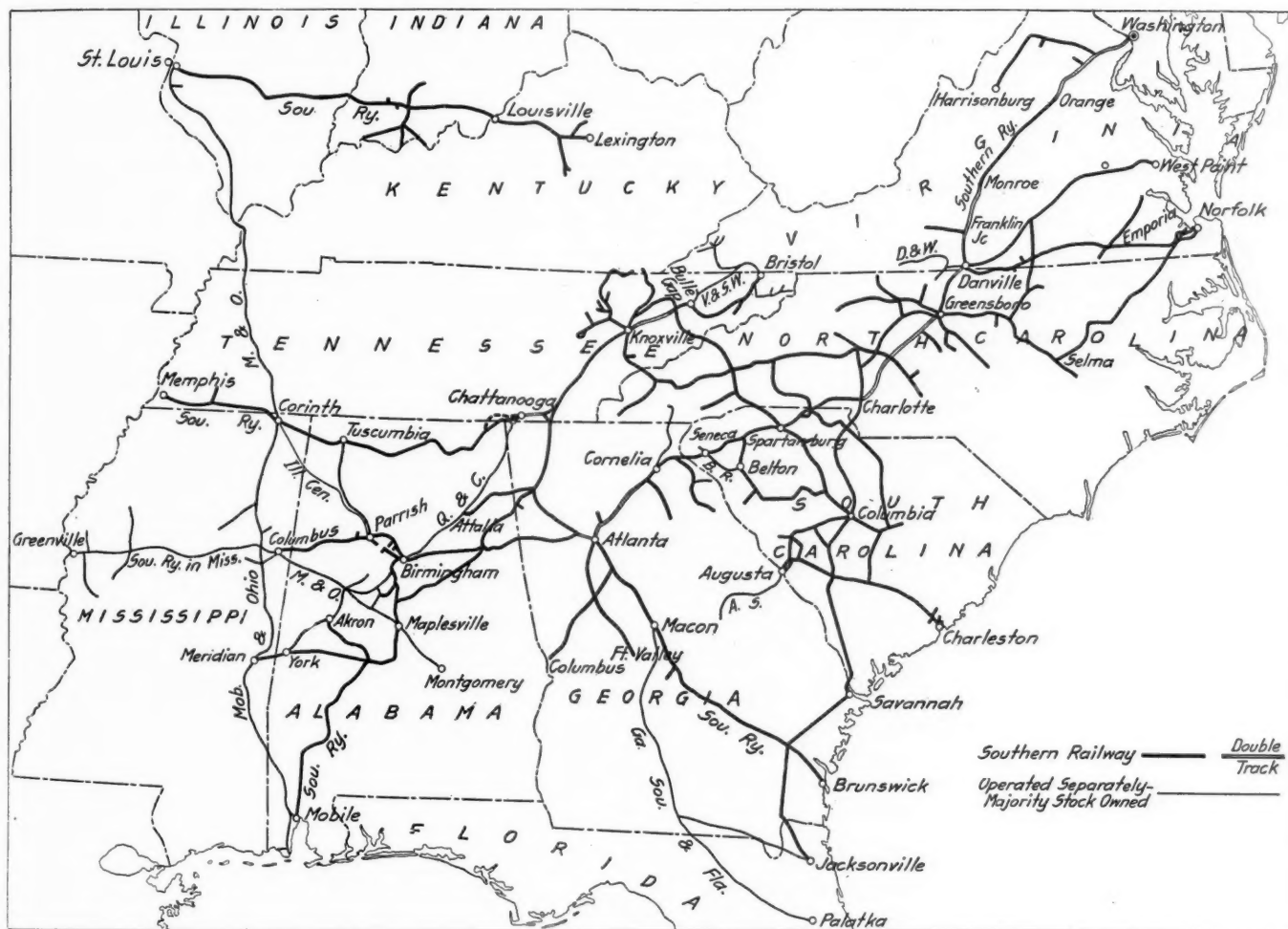
company had a surplus of \$4,079,000. This, however, tells only part even of the financial history of the company for the year. During this year the Southern paid off out of treasury funds \$5,000,000 notes and spent \$3,517,000 for additions and betterments, the only capital securities sold being \$1,500,000 first consolidated mortgage 5 per cent. bonds.

The operating "story" is suggested by an increase in ton miles of 8.81 per cent. (the total ton mileage in 1913 being 4,577,500,000) and in passenger miles of 7.40 per cent. (the total number of passengers carried one mile in 1913 being 844,800,000), with an increase of but 6.90 per cent., or \$1,523,000, in transportation expenses, which includes about \$574,000 increases in wages.

Of course, what the Southern Railway has needed, ever since the consolidation of its network of lines, has been increased traffic. In 1908 gross revenue per mile was \$7,187; in 1913 the Southern earned gross \$9,903 per mile. The history of the building up of this traffic has been told before in the *Railway Age*

end of 1909, and also of all discount on securities sold since then.

Maintenance of a railroad property, and its service to the public, its ratio of transportation expenses to total operating revenues, and its credit, are all inseparably interrelated and all are dependent to a large extent on the betterment of the plant. Under a less able management and, of course, also under less favorable development of the country, which again is due in no small measure to the efforts of the Southern Railway management, it would have been impossible for that company to have lifted itself out of the hole that it was in in 1907 by its own boot straps; but that is just what has been accomplished. Money earned has been put into additions and betterments; dividends were deferred until the more pressing needs of the property were met; maintenance expenditures were increased as rapidly as earnings justified; and the net result of it all is beginning to be shown in the decrease in transportation expenses per unit of work done and



The Southern Railway.

*Gazette*, and is told from time to time in Mr. Finley's addresses better than we can possibly tell it; but the full measure of the achievement in conserving to the company its legitimate share in the growing prosperity is more likely to be lost sight of because at first glance it is less striking.

The keynote of this development has been intensive conservatism. In 1908, when operating income, after the payment of expenses and taxes, was \$11,080,000, interest on funded debt, equipment trust certificates and rentals was about \$11,800,000, while in 1913, with operating income of \$17,856,000, interest and rentals were but \$12,595,000. During these years the company has paid out total preferred dividends of \$6,900,000, while it has increased its profit and loss surplus from \$5,791,000 to \$17,375,000, and at the same time completely gotten rid of \$1,991,000 discount on securities sold, which it was carrying at the

in the substantial surplus of \$4,079,000 after the full 5 per cent. on the preferred.

The following table shows the ratio of each class of expenses to total operating revenues:

	1913.	1912.
Maintenance of way and structures.....	13.54	12.33
Maintenance of equipment.....	16.48	15.90
Traffic expenses .....	3.06	2.74
Transportation expenses .....	34.45	34.72
Total .....	70.44	68.71

Maintenance of way in 1913 amounted to \$1,318 per mile of road maintained; and repairs of locomotives, exclusive of renewals and depreciation, to \$2,615; repairs of passenger train cars, \$735; and repairs of freight train cars, \$66.

The Southern Railway operates 7,036 miles of road and had a freight density in 1913 of 804,000 tons, an increase over 1912 of 9.57 per cent.; and a passenger density of 120,070. The aver-

age freight train load of revenue freight in 1913 was 260 tons, as against 250 tons in 1912; and the average number of passengers per train, 46 in 1913 and 44 in 1912; the average haul of freight being 155 miles in both 1913 and 1912, and the average passenger journey, 44 miles in 1913 and 43 miles in 1912.

Of the total tonnage carried, amounting in 1913 to 29,450,000 tons, 40 per cent. was products of mines, 30.03 per cent. manufactures and miscellaneous, 16.98 per cent. products of forests, 11.89 per cent. products of agriculture, and a little over 1 per cent. products of animals.

The following table shows the principal figures for operation in 1913 as compared with 1912:

	1913.	1912.
Average mileage operated.....	7,036	7,088
Freight revenue .....	\$44,943,748	\$41,508,300
Passenger revenue.....	18,220,489	16,939,811
Total operating revenues.....	68,529,490	63,590,329
Maint. of way and structures..	9,275,553	7,841,220
Maint. of equipment.....	11,290,337	10,108,673
Traffic .....	2,094,010	1,745,353
Transportation .....	23,605,046	22,081,653
General expenses.....	2,008,977	1,919,337
Total operating expenses.....	48,273,924	43,696,236
Taxes .....	2,480,387	2,452,328
Operating income.....	17,855,715	17,506,519
Gross income.....	21,221,686	21,086,961
Net income.....	7,078,625	6,763,117
Dividends .....	3,000,000	2,700,000
Surplus .....	4,078,625	4,063,117

### NEW BOOKS.

*Proceedings of the Society for the Promotion of Engineering Education.* Part 2, Volume 20. Size, 6 in. x 9 in., cloth binding, 508 pages, illustrated. Price \$1.25. Published by the society, H. H. Norris, secretary, Ithaca, N. Y.

This volume contains that portion of the proceedings of the twentieth annual meeting held in Boston, June 26-29, 1912, relating to the work of engineering laboratories in all divisions of engineering and includes 55 papers and discussions. Among the papers of special interest are a discussion of "The Characteristics of the Mechanical Engineering Laboratories of American Engineering Colleges," by Prof. Wm. T. Magruder, a detailed description of Charlottenburg laboratories by R. R. Heuter; a description of the new Robinson laboratory at the Ohio State University by Prof. Horace Judd, and a paper on the teaching of elementary physics by Profs. W. S. Franklin and B. MacNutt.

*Factory Lighting.* By Clarence E. Clewell. Bound in cloth. 156 pages. 6 in. x 9 in. Illustrated. Published by McGraw-Hill Book Company, 239 West 39th street, New York. Price \$2.

Examples can be seen on every side that a large amount of artificial lighting does not necessarily mean good lighting. Violations of the principles of good illumination have been frequent in otherwise perfectly appointed shop buildings and offices. There is no doubt that good lighting is an aid to accurate workmanship and manufacturing output, and contributes to a large extent to a reduction in manufacturing cost. The author of this book has been engaged in the design and supervision of the installation of lighting systems for a number of years, and aims to tell how to obtain good lighting and to tell it in a simple way. The experiences of actual installations are made the basis for analysis and explanation throughout the book. Actual results are given precedence over generalized statements. The office, the drafting room and the power house have been given consideration as well as the shop itself. One chapter is devoted entirely to machine tool lighting and the insignificance of the cost of adequate lighting for machine tools is illustrated by the statement that the energy and maintenance of an individual electric lamp amounts to 25 cents a month, while the operator who depends on the lamp receives \$3 a day. Therefore, the cost of the lamp is equal to the wages for two minutes each day, and if the better illumination will save the workman that amount of time it is a paying investment. Photographs are freely used to emphasize the facts explained in the type and drawings of typical installations are included.

## Letters to the Editor.

### THE SANTA FE LOSS AND DAMAGE COMMITTEE.

ST. JOSEPH, Mo., October 9, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Throughout the week of September 29 the transportation, traffic and claim officials of the Santa Fe railroad, to the number of 100, held in St. Joseph a semi-annual meeting of the Santa Fe System Loss and Damage Committee. On one day of this meeting the members of the committee were guests of the Commerce Club of St. Joseph at luncheon when the nature and scope of the work of the committee was explained to the club members, who, in most part, were shippers of freight.

Information was given as to the magnitude of the item of loss and damage, what effort is being made to prevent such waste or reduce to a minimum and how this undertaking could be advanced by better packing, better marking and better handling. The lucid presentation of the subject attracted keen attention and elicited assurance from shippers present of a willingness to co-operate in securing the desired result.

This coming together and the free interchange of experiences and views on a subject of such great importance should not fail of producing excellent and lasting results. In conference of this kind opportunity is afforded for working out in a practical way the "get-together" spirit, between carriers and shippers, concerning which so much has been said in the past few years. The example set by the Santa Fe in this instance, by taking the public into its confidence, is one which might with profit be followed by other railroads, and in other branches of their work for the betterment of service to be rendered the public.

Though it may not thus always appear, it is nevertheless, I believe, a fact that the shipping and traveling public as a whole wishes to be reasonable and fair in dealing with the railroads, and will treat with them in that spirit when enlightened on the problems and difficulties with which they (the railroads) have to contend, and come to appreciate that the railroads are honestly striving to fully meet their public obligations. True it is that for some time the railroads have in a general way been trying to impress on the public mind the efforts they are making for improved service and added safety—and have made progress in that direction, but the closer personal touch, as in the case cited, is of more immediate and telling effect, and secures more ready response than it is possible to develop by other means. In the advancement of a closer community of interest between the railroads and the public let us hope that the policy of the Santa Fe Loss and Damage Committee may be enlarged and extended.

H. G. KRAKE,

Commissioner, Commerce Club of St. Joseph.

**PASSENGER TRAFFIC AND FESTIVALS IN INDIA.**—The great festival of Ruth Jahr, at Puri, has proved so paying to the Bengal-Nagpur Railway that it spares no pains or money towards the convenience and comfort of pilgrims, even at the junctions with foreign lines. The reports of the committee appointed by this railway to inquire into the arrangements connected with festivals make interesting reading. They show that the officers go into the genesis of each festival and make the arrangements according to the needs of the various classes of pilgrims. Very soon a lunar eclipse will be visible in India. The occurrence of a lunar eclipse on a Monday and under certain conditions is looked upon as a rare occasion for rites and ablutions among Hindus. This Chudamani Yoga will move many thousands of pilgrims to bathe in the holy waters of the Ganges, the Nerbudda, the Canvey, the Jumna, the Godavery, and the Indus. Though this lunar eclipse will benefit all the railways leading to many holy spots, it will be a strain on the Bengal-Nagpur Railway, which serves more than one center of attraction; but the road seems to be equal to these occasions.

# THE FLAGGING RULE AND ITS ENFORCEMENT.

## The Complexity of the Every-Day Problems Which Face the Flagman on the Road and the Trainmaster in the Office.

The prominence given to the question of flagging in two recent reports on collisions—Tyrone, Pa., July 30, and North Haven, Conn., September 2—has led to a good deal of fresh discussion of this very old subject; and in view of the great variety that obtains in flagging practice, under different conditions, it will be timely to restate some of the conditions under which this very troublesome regulation has to be carried out. Everybody admits that we have here a complicated problem, but only rarely does any one analyze it with the thoroughness which its importance demands.

The flagging rule of the American Railway Association is as follows:

99. When a train stops or is delayed, under circumstances in which it may be overtaken by another train, the flagman must go back immediately with stop signals a sufficient distance to insure full protection. When recalled he may return to his train, first placing two torpedoes on the rail when the conditions require it.

The front of a train must be protected in the same way, when necessary, by the ———.

The flagging rule of the New York, New Haven & Hartford, as quoted in the Interstate Commerce Commission's report on the North Haven collision is as follows:

When a train stops or is delayed under circumstances in which it may be overtaken by a following train or needs protection, flagman must go back immediately with danger signals a sufficient distance to insure full protection.

If upon a level or up grade, he will fasten one torpedo on top of rail at least 12 telegraph poles from the rear of his train; then go back 6 poles farther and fasten two more torpedoes on top of rail one rail length apart; if on a down grade he will fasten one torpedo on top of rail at least 18 telegraph poles from the rear of his train, then go back 18 poles farther and place two more torpedoes on top of rail one rail length apart; after doing this he may return to a point between the torpedoes placed and wait for any approaching train, prepared to display proper signals in full view, using every effort to attract attention in season to stop it. When recalled he will look and listen for any approaching train, and if none is located take up the single torpedo nearest the train (leaving the other two) and return. If recalled before placing torpedoes the required distance, a fusee should be lighted and left on the track. If called in after the train which he is protecting has taken a siding to allow a following train to pass, he will leave no torpedoes or fusee. Should the grade be heavy, weather bad, or view likely to be cut off by smoke from passing trains, he must go as much beyond the distance named as circumstances may make necessary to safely protect his train.

In flagging at night great care must be used that a green or white light does not obscure the red. Stop signal should be swung until answered by approaching train.

When, upon single track, it becomes necessary to protect the front of the train or when another track is obstructed the front brakeman (when necessary the fireman) must go forward and use the same precautions.

*Rule No. 99b.*—When the flagman goes back to protect the rear of his train the next brakeman must immediately take the flagman's position on the train and remain there until relieved by the flagman, and on passenger trains the baggage-master must take the place of the front brakeman whenever necessary.

In the Tyrone case the government report does not quote the rule, but says that at a station stop the flagman and conductor are allowed to decide how long a time should be allowed to elapse before flag protection is required; and the report holds that if there had been a rule requiring the flagman to go back in one minute that collision probably could have been thus prevented.

As before stated the purpose here is only to set forth some of the conditions of the problem. To go into the subject in any satisfactory detail would require a book. As everybody knows, the elaborate detail which is found in the rule of the New Haven road, and which, with numerous variations, is to be found on some other roads, is the result of extended discussions in American Railway Association committees; which discussions, so far as the association standard is concerned, ended in a rule of a half dozen lines, couched in very general terms,

because of the impossibility of reaching an agreement on anything more specific.

Considering, now, only block signaled roads, the reasons for flagging are few and simple. The block signal system is not perfect; enginemen will not always heed a signal on a post, but will heed a lantern or a stone thrown by the flagman through the cab window; and, thirdly, passengers are perhaps afforded an added sense of security by seeing the flagman go out. A fourth argument is that the audible signal given by the flagman by means of torpedoes is less costly than any fixed audible signal could be. The arguments may be summed up in the statement that all machines and appliances and all persons are liable to failure, and therefore that it is necessary to have duplicate protection.

The arguments against flagging are based (1) on the lesson of experience that when two men are made responsible for doing voluntarily the thing necessary to accomplish a single purpose, each, in many situations, is likely to neglect his own duty, and to depend on the other man; and that there is no practicable way to cure this defect in the scheme; and (2) that flag protection is such a complex problem that no experienced railroad officer has found a satisfactory solution of it. In England they have practically given up the attempt. They still have the rule, in the book, but only rarely does a government inspector discuss the flagman's function; and evidence of any enforcement of the rule seems to be still more rare. Everybody in America puts up with a partial solution of the problem. If, in a given case, the flagman goes back at once, and goes the full distance; and if the following train has not exceeded the speed limit, the flagging will probably be effectual (though if the following train is far behind, and the flagman becomes listless, all will then depend on his torpedoes).

The main difficulty with flagging is the delicacy of the questions which must be settled by the flagman in each case. How long should I wait before starting back? Ten seconds? Or one minute? Or two minutes? The rule requiring the man to go without waiting at all, except in case of regular stops, leaves everything at loose ends. Often a regular stop proves as dangerous as any other. Just what is a regular stop? In many cases this needs interpretation. The Tyrone collision occurred at a regular stop. There, if anywhere, the flagman might properly delay. If he never delays starting, he is likely to have to go back a dozen times on every trip, and either the train will be greatly delayed or will go on without him. Going on without him is all right in many cases, if the rule is observed in the same way by all trains, as the flagmen from the preceding train will be picked up successively; but to depend on men thus picked up is a very unsatisfactory reliance. The preceding train may be going to some different terminal; or a man who has been on duty one hour may be exchanged for one who has been on for 10 hours.

In the Tyrone report Mr. Belnap recommended that the flagman should go back after waiting one minute; but what railroad officer would expect to enforce such a rule with any uniformity? To start in 50 seconds would be wrong, and would delay the train. To wait 80 seconds would be a violation of rule, meriting severe punishment. To start and go only a short distance and then return may be more dangerous than not to go at all, for torpedoes or fusees put down, say, 500 ft. from a train, allow too short a distance for a fast train to stop. It may be said that while the flagman is going the 500 ft. his train could be moved forward a hundred or a thousand feet; but here again there would be much difficulty in enforcing the rule in any systematic way.

A flagman trying to obey the rule is always in doubt whether to go back rapidly or slowly. In two minutes he might easily go 1,000 ft.; but he well knows that a two-minute stop will, in all probability, be perfectly safe without flag protection, and he hesitates to cause the four-minute delay. It is, of course, possible and perhaps probable, that when at last the case happens where a following runner is careless, the flagman, even under the present unworkable rules, will have got back far enough to stop him. Flagging is, at times, effective. But the essential point of the argument is that no rule can be made which is safe and satisfactory to the superintendent and easily understood by the brakeman. It is common to ascribe negligence in flagging in all cases to the laziness, or at least to the dull judgment, of the flagman; but it is by no means certain that this is a fair way to treat the matter. There are plenty of cases where a brakeman possessing a reasonable brakeman's judgment finds himself in perplexity. The book will tell him to settle the doubt by going back; but the most positive orders will often fail to change a life-long habit, as we have seen in the case of Engineman Miller, who, in spite of the superintendent's admonition to lose time in fog, stuck to his habit of making just as good time as he believed possible. The brakeman's habit is to stay with his train if he can. To require him two, ten or forty times a day, deliberately to suspend that habit because, by a little course of reasoning, he reaches the conclusion that he ought to go back, is to put on a brakeman a responsibility for which many tutors of philosophy, logic or mathematics would be none too well fitted. Must we not admit that the only rule that is workable and logical, is to have the man go back at every stop, and always go the full distance? Any relaxation of this requirement introduces uncertainties which no rule-maker or disciplinarian has ever been able to cope with. It seems absurd to have the flagman regularly go back at every passenger-station stop; in a majority of cases it is absolutely useless, whether the stop be two minutes or twice or three times that length; but without such a rule, flagmen are always calculating as to what kind of a train is following, how far back it is, what kind of man is running its engine, and indulging in various speculations; whereas the rule requires them to refrain entirely from these speculations. Can anybody enforce this rule?

These are troubles which immediately affect the flagman; not all of his troubles, by any means. But the superintendent has still others. If there are ice-covered bridges within the flagman's path, or if the temperature is 40 deg. below zero; or if a furious snow storm makes torpedoes unreliable, the protection afforded by the most faithful flagman is of questionable value and the superintendent must avoid unnecessary dependence on it. The flagman may be of heroic temperament, but if he is made up of ordinary human clay, even in part, he will constantly reflect that his heroism is likely to be wasted. At junctions a flagman who goes back is likely to find that, to obey the rule he must go back on two different lines!

The superintendent's most constant difficulty is to get men of the right quality. To get those who are honest and intelligent and who will keep themselves free from whiskey, is not always easy. Wages are now pretty high, but men with the strength of character needed for this work evidently find it easy to get more attractive occupation elsewhere. This seems to be partly due to lack of care on the part of railroad officers in selecting men from outside for the train service; but the unavoidable difficulties are serious. In the freight service most men find little incentive to cultivate themselves either mentally or morally. A successful flagman in that service may be unfit for promotion to the passenger service because he cannot adapt himself to the work of dealing with passengers. Outsiders put into the passenger service without freight experience are in danger of going years without learning some of the important safety-lessons of their calling. In the attempt to get for his passenger trains efficiency, experience and politeness, all in one person, the trainmaster often fails even of fair success. No

sooner has he in some degree purged a new man of his dullness, ignorance or lack of ambition, than the unfavorable effect of too frequent changes is likely to show itself. The trainmaster himself is likely to be transferred or promoted, interrupting an unfinished task; but even if he continue in his position a reasonable time, changes in the men become necessary, for obvious reasons; and fluctuations of passenger business in spring and autumn break up the best of plans. To have a thoroughly satisfactory force of experienced and reliable flagmen at all times, many companies would have to keep on the payroll through dull seasons from 10 to 25 per cent. more than their minimum force. This is so costly that few if any roads do it.

The greatest difficulty of all is that of training men's habits of mind so that they will carry out the rules simply as a matter of duty. Any flagman can see that under the block system his flagging will be of value not once in ten thousand or a hundred thousand or more times. And his duty, the duty to perform a seemingly useless function, is made more difficult by that clause of the rules which authorizes the flagman to use his own judgment, at least to some extent, as to time of starting and distance to be traversed. The rule would be much easier to enforce if it permitted the flagman no discretion whatever.

Every interested reader will recall concrete examples of situations illustrating these perplexities. Just now these examples are numerous on the New Haven road. (Always, on all roads, the perplexities of flagging have been more apparent in the weeks following a disastrous collision. At other times the perplexities are mostly concealed under the flagman's or the conductor's hat.)

At Stamford, recently, a westbound passenger train stopped to change engines a little distance east of the station, the same place where this was done on the fatal twelfth of June. The flagman went back about five or six hundred feet. The stop was about four minutes. It was broad daylight. When the flagman came in he lighted a fusee and stuck it in a tie. The fusee probably would not be seen by an approaching engineman as soon as he would see the rear car of the train, so long as the train stood there. The fusee was useful, if useful at all, simply to provide a time interval after the train had gone out of sight. But, under manual signalling, it is only once in a million or several million times, that another train will come along. Under automatic block signalling, with a rule under which a following train, after having stopped at a stop signal may proceed under control, the fusee is liable to have the effect of encouraging runners to ignore the rule to run under control. The fusee at best is a means of indicating a time interval; and the requiring of a time interval always tends to weaken the men's respect for the space interval. This flagman could fairly be said to be on the ground, alert, ready to flag if flagging should become necessary. Quite likely that was all that was really expected of him; but if so, why have him go back five hundred feet?

Mention has been made of the possible effect of flagging on observing passengers; cases of this kind, or very much like it, observed every day by passengers, serve to give them an unfavorable impression. The flagman's apparent indecision may, indeed, seem to them worse than it really is.

Another westbound train approached Stamford about 8 o'clock on a rainy night, and was stopped farther back, the preceding train having been slow in changing engines. This stop lasted ten or fifteen minutes. The flagman got back a long distance, presumably as far as was required by the rule. The presence of long freight trains on other tracks, and of yard movements not far away, together with numerous lights in houses and street lamps, made it unsafe to depend on one's eyes for the location of anything except at very short range. When the train was ready to go, it had to wait six minutes for the flagman to come in. In such a case, to wait for the flagman (not knowing exactly how long it will take him to come in) or, to go on without him, is a question which the conductor must decide as best he can; the seriousness (or otherwise) of losing six

minutes, the effects of this delay on other trains, the likelihood of picking up another flagman, the number of miles yet to be traversed, all will be taken into account. If there were any doubt of the flagman's faithfulness and intelligence in putting down torpedoes, that also would affect the conductor's decision.

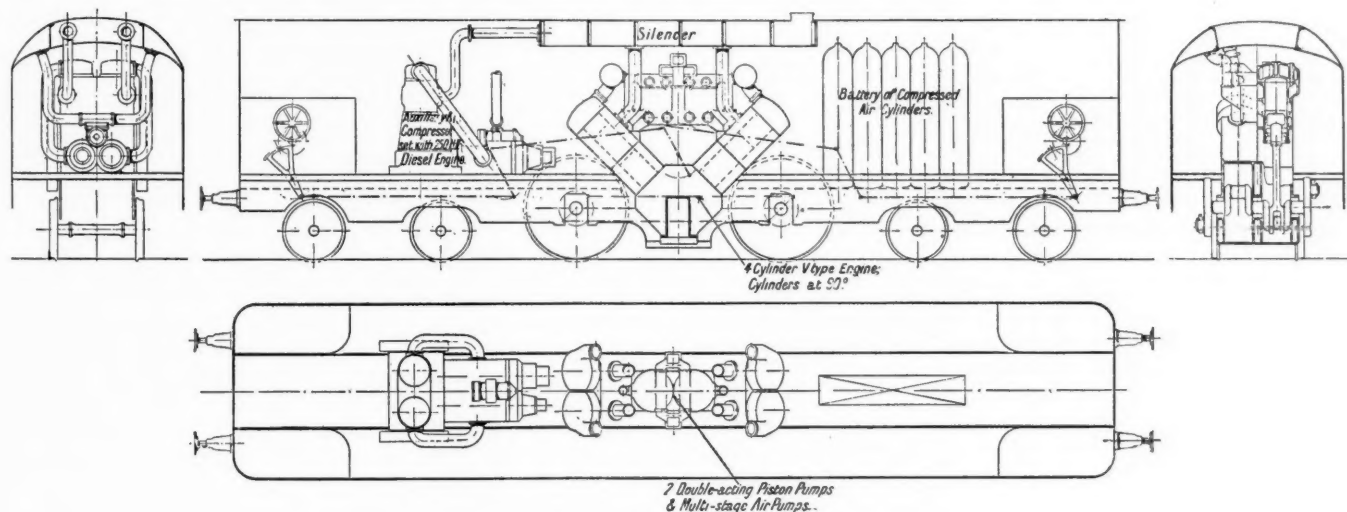
Consideration of cases like this leads to the conviction that trains many times reach the end of the division, ten, twenty, or thirty minutes late, because of unexpected stops and time lost in flagging, when, if the conductor had taken all precaution, at every one of those stops, he would have been nearer sixty minutes late than thirty; in short, that conductors often decide that the circumstances are *not* such that they "may be overtaken by another train" (Rule 99), when such decision really depends on one or more uncertain elements. In other words, that he decides this question by the exercise of his judgment, and that his judgment will sometimes fail. The very fact that, even if his judgment be wrong, no harm results, perhaps, for years, has a constant tendency to weaken the conductor's vigilance. He is in the dangerous position of getting apparently good results from defective means.

Because of what may be called the extreme conservatism of the American railroad mind, difficult questions in train operation have usually been settled, if settled at all, only by the slow process of waiting for error to die a natural death. The foregoing observations are presented as a suggestion that here is

Rapid Transit Company, New York, the Boston Elevated, Boston, and the San Francisco-Oakland Terminal Lines. It is to the effect that the automatic stops on those lines have cured the motormen of their carelessness. The testimony of Paul Winsor, of the Boston Elevated, heretofore given in the *Railway Age Gazette*, is quite definite, to the effect that over-running of signals has been abolished. This point is mentioned here, not by way of advocating automatic train stops, but as evidence of the peculiar value of anything which aids in enforcing strict discipline. Many will say that the automatic stop, as a means of applying brakes, is an undesirable thing; but as a means of convincing runners that every disobedience will be detected, it is a very valuable thing. Experience with derailing switches, and "smash" signals at drawbridges, gives weight to this view. The problem of securing obedience at all signals may be in many respects different on the ordinary railroad from what it is on the Boston Elevated, with its moderate speeds; but, nevertheless, Mr. Winsor's testimony is not to be lightly brushed aside.

### DIESEL LOCOMOTIVE.

A locomotive operated by Diesel oil engines has recently been furnished by Sulzer Brothers, Winterthur, Switzerland, to the



General Arrangement of the Sulzer-Diesel Locomotive.

one difficult question which ought to be settled by some faster process. If they have the appearance of a highly colored argument, fabricated by a pessimist, that should only make it the easier for the optimist to establish the optimistic view.

It was not the intention to lengthen this long article by going into the question of a remedy for the flagging disease, but it will be allowable, perhaps, to recall two suggestions; one by a former superintendent of the Erie, affecting lines worked by the manual block system, and the other by officers of roads equipped with automatic signals, where automatic stops have been used.

The Erie man, arguing with his fellow officers, who stood up for the value and importance of flagging, said: "Very well; if our block signals must be supplemented by flag and torpedoes, let us have the block signal man go down stairs, after each train, and put torpedoes on the track and stand there with his hand flag. If the flagging on the ground is necessary it is necessary at a great many places and times where we cannot trust the train flagman, or the conductor, or both of them, to decide just what to do; and the logical course is to have this flagman, whose location is known and who can be reached at any time by the trainmaster, do the work in a business-like manner."

The other suggestion is from officers of the Interborough

Central Railway Department of the Prussian-Hessian State Railways at Berlin.

According to the Whyte system of classification the locomotive is of the 4-4-4 type, there being a four-wheel truck on either end with two pairs of driving wheels in the center. The engines are of the four cylinder V type and drive a crank shaft which is connected to the driving axles; there is also an independent air compressor set of about one-quarter the power of the main engines. The compressed air is employed for starting the engine and a number of air cylinders are used to provide storage capacity.

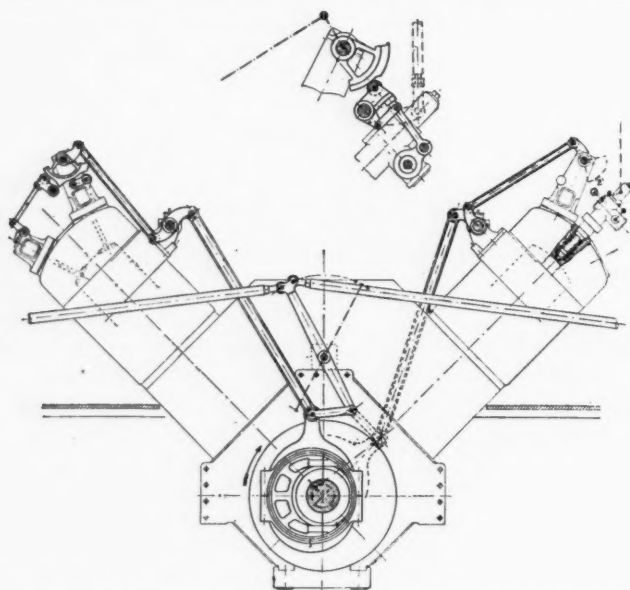
The cylinders are set with the center lines of the barrels at 90 deg.; they have a diameter of 15 in. and a stroke of 21.7 in., and the cranks are 180 deg. apart. The engines are of the reversible, two cycle type and are single acting. The crank shaft has three bearings in a cast steel frame casing carried by the main frames. Each cylinder has a fuel valve through which fuel is injected to the cylinder under a pressure of from 50 to 70 atmospheres; a starting valve for the supply of air to the cylinders at a pressure of 50 atmospheres; and two scavenging valves for low pressure air at about 20 lbs. absolute pressure. The exhaust takes place at the end of the down stroke through ports in the cylinder walls. The valves are driven by two loose eccentrics which can

be thrown over to effect reversing; one eccentric controls all the valves of two cylinders. Between the four cylinders of the main engine are placed two double acting piston pumps and a multi-stage air pump. These are all driven from the connecting rods of two of the main cylinders by means of links and rockers. The three stage air pump acts as a reserve for the auxiliary compressor set and if the latter should fail the engine air pump can supply sufficient air, provided the demand on the locomotive is not too great.

The cab encloses the entire locomotive and the fuel and circulating water are contained in four tanks constructed at the corners. A silencer for the exhaust is provided in the roof over

cut out the fuel valve and apply the brakes; and in order to reverse, the hand wheel in the cab is operated, locking gear preventing reversing until the fuel valves have been thrown out of gear.

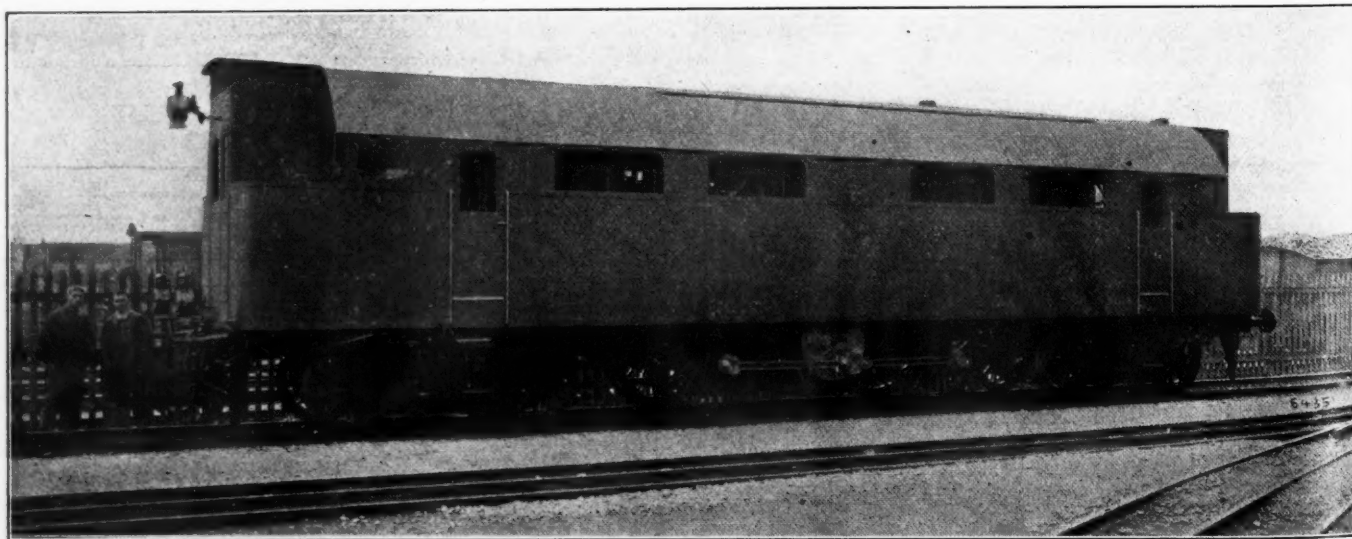
The locomotive was designed for fast passenger traffic and has developed a speed of 62 miles per hour when running at 304 revolutions per minute. It is 54 ft. 6 in. long over all and weighs in working order 95 tons. The driving wheels are 5 ft. 8 $\frac{3}{4}$  in. in diameter. Tests were carried out on the Winterthur-Romanshorn line where speeds of from 12 to 60 miles an hour were obtained and trials have since been made on the Berlin-Mannsfeld line. It is reported that the change from air to oil fuel is accomplished without any trouble at a speed of from five to six miles per hour and the reversing arrangements are found to be satisfactory.



Four-Cylinder V-Type Engines Used on the Diesel Locomotive.

the main engine and the coolers for the jacket water are placed over the cab. The reversing and other mechanism is so arranged that the engine can be controlled from either end. The auxiliary engine is started first by the admission of air from the air reservoir, slowly at first. After the auxiliary has been changed to oil fuel the pressure in the air storage cylinders rises and the air supply is admitted to the main engine, which consequently commences to work. When a speed of about six miles an hour has been reached the starting air valves are thrown out of action and the engine is changed to oil fuel and works normally, the fuel feed and the injection air being controlled according to the speed and power required. In stopping it is only necessary to

**PROSPECTIVE CONGESTION ON PRUSSIAN RAILWAYS.**—It is not surprising that, in view of last year's unprecedented congestion on the Prussian Railway system in the industrial districts of Essen and Westphalia, the Prussian State railway administration has already begun to take active steps so as not to be found napping this year. Although, according to reports from the Berlin chamber of commerce, there are many signs of a slackening in the great activity experienced for some time past in the commercial and industrial world, it is not expected that this will affect the Prussian railways. In fact, the claims on the rolling stock, as far as can be foreseen, will be even greater than last autumn. This opinion is supported by the fact that there is the constantly increasing demand for coal, which will be specially heavy this year. Another reason is that the waterways in the East of Prussia are not likely to relieve the railways. On the contrary, much traffic which formerly went by inland waterways will have to be carried by rail. The traffic on the Oder has been repeatedly interrupted owing to floods, that of the Elbe in consequence of drought, so that neither of these have been able to develop their traffic to the full extent. It is not unlikely, therefore, that a portion of the goods which otherwise would have been carried by water, especially those delayed in delivery, will have to be carried by rail. Moreover, the prospects of the sugar-beetroot and potato harvests are even better than last year, so that in this direction alone there will be a greater demand on the rolling stock this autumn than last. Taking a general view of the whole situation, it may be safely estimated that the railway traffic on the Prussian system in the next three months will surpass the heavy traffic of last autumn. It remains to be seen whether the measures taken by the Prussian railway administration will be so ample as not to cause such a sensational congestion as last year.



Sulzer-Diesel Locomotive for the Prussian-Hessian State Railways.

# RENEWING TWO DOUBLE TRACK SWING SPANS.

Replacing the Bridges on the Jersey Central Over Hackensack and Passaic Rivers and Rebuilding  $2\frac{3}{4}$  Miles of Line.

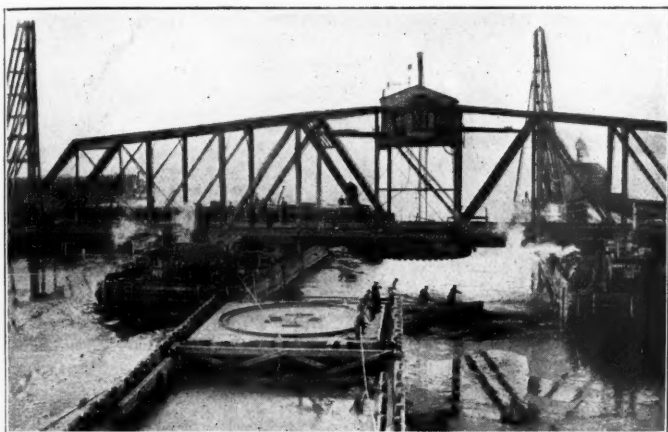
In connection with the replacement of two swing bridges on the Newark and New York branch of the Central Railroad of New Jersey, the grade has been elevated for about  $2\frac{3}{4}$  miles, the maximum change being about 22 ft. The old bridges which spanned the Passaic and the Hackensack rivers were double track structures but had been operated with a gauntleted single track for several years in order to prevent overloading. It was very desirable to provide an unobstructed double track over these bridges, and it was finally decided that it would be more

eliminate fully 90 per cent. of the bridge movements. In order to keep railway traffic moving continually during the construction work, it was necessary to build a temporary double track line the entire length of the improvement, temporary trestles being driven across the rivers and the old swing bridges moved over to provide temporary draw spans.

## MOVING THE OLD SPANS.

It was necessary to move the old spans from their original location to the new temporary line as quickly as possible so as not to interfere with traffic longer than necessary. This movement was made on scows, the bridges being floated into place on Sunday when there was very little river traffic and train movements were less frequent. The trains that had to be operated to Newark were sent around by way of Elizabethport so that no interference to traffic was occasioned by the work. The scows were 105 ft. long, 31 ft. wide and 9 ft. deep, of very heavy construction, with longitudinal and transverse trusses. The bridges were supported on timber blocking resting on these scows which are located under the floor beams at the midpoints of the two channel spans. The center lines of the scows were painted on the blocking and the center line of the bridge was similarly marked on the floor beams to allow the scows to be accurately and rapidly located at the proper points. The top chords in the three center panels and certain web members of the old trusses were strengthened by timber blocking so that the eye bars could carry compression resulting from the reversal of stresses when the truss was supported on the scows.

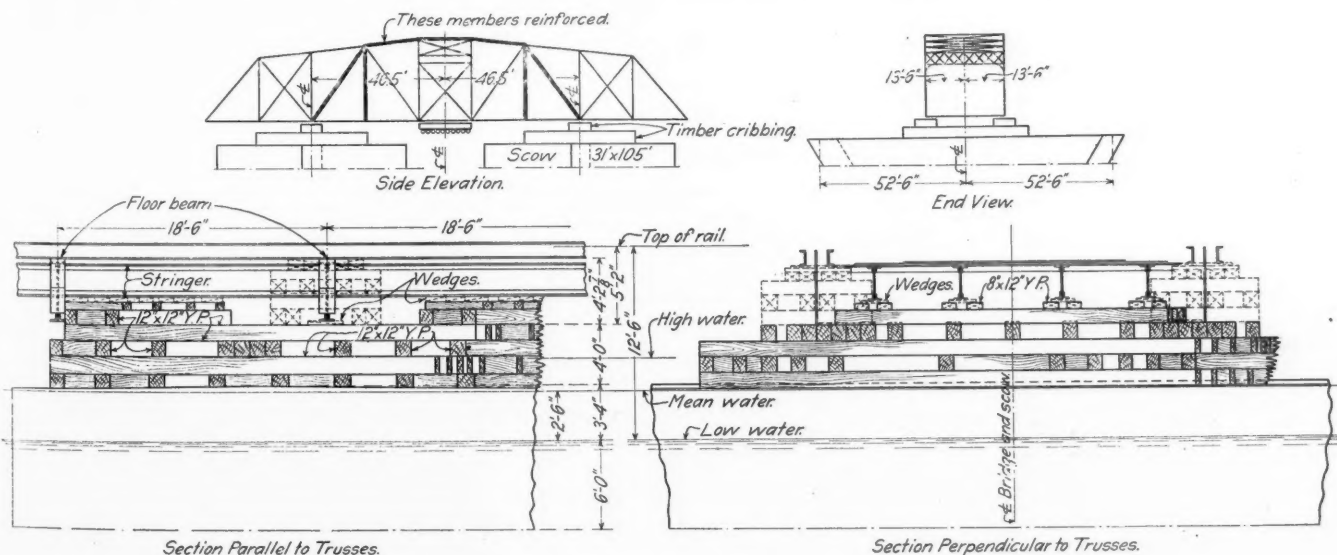
The temporary line was located as close as possible to the old one, this distance being fixed by the length of the racks on which the new spans were erected. The old swing spans therefore could not be placed in the temporary structure opposite the new span. As the new swing span over the Passaic was to occupy approximately the same location as the old, it was necessary to shift the old span longitudinally about 100 ft. The tim-



Moving Old Hackensack Draw Span to Temporary Position.

economical to build new structures than to attempt to strengthen the old ones. The decision to build new bridges was also influenced by the fact that this plan provided an opportunity to raise the grade and eliminate a large number of bridge movements.

The old line was only a little above the meadows which lie between and along the two rivers, but the new grade will be



Details of Method of Carrying Old Draw Span on Two Barges.

on a fill from 15 to 30 ft. high, beginning at West Side avenue, Jersey City, extending level across the two rivers and dropping west of the Passaic on a 0.5 per cent. grade to a connection with the old grade near the crossing of the Pennsylvania and the Lehigh Valley. It is thought that this elevation, which gives 25 ft. clearance above mean high water at the two rivers will

ber cribbing and fenders of the old span limited the space for working, making it necessary to move this span transversely about 75 ft. to clear the old piers and crib work, then longitudinally to a point opposite the new location and then transversely again until it could be lowered on the new center pier. The location of the new span at the Hackensack was far

enough from that of the old to allow the temporary position of the old span to be fixed opposite its original location. The movement in this case therefore was entirely transverse.

In moving the old bridges, the temporary trestle was first driven, the temporary center pier built and all equipment necessary was provided, the plans for carrying out the work having been very carefully prepared. Traffic was turned off at midnight and the actual operation of moving the bridge began about 3 o'clock in the morning. The two scows which had been located above the bridge with their cabin ends up-stream were floated under the bridge at low tide, carrying sufficient water ballast to allow the blocking to clear the bottoms of the floor beams. As the tide rose, the sea cocks were opened to prevent the scows lifting the bridge until all the blocking had been placed. The stringers and chords were blocked up as well as the floor beams, care being taken to keep the pressure uniform at all points of support. The bridge was raised by pumping out all the water ballast, this being done on a rising tide. The movement was made by hoisting engines, the lines being attached to pile drivers used on the temporary trestle. During the moving of the span the pivot, spider and turntable were carried from the chords and floor beams by yoke timbers and vertical hook and screw bolts.

When the bridge was in position over the new pivot pier it was lowered by means of the water ballast and the scows were removed up-stream. The lowering of the bridges was also done on a rising tide and the elevation of the Hackensack bridge in the new location was about 2 ft. higher than in the old. The old Passaic bridge which was 217 ft. long and weighed 400 tons, was moved in 50 min., although traffic was not turned over in its new location until 4 p. m. Sunday. When the Hackensack bridge was moved, the line was out of service from 12 midnight to 12 noon.

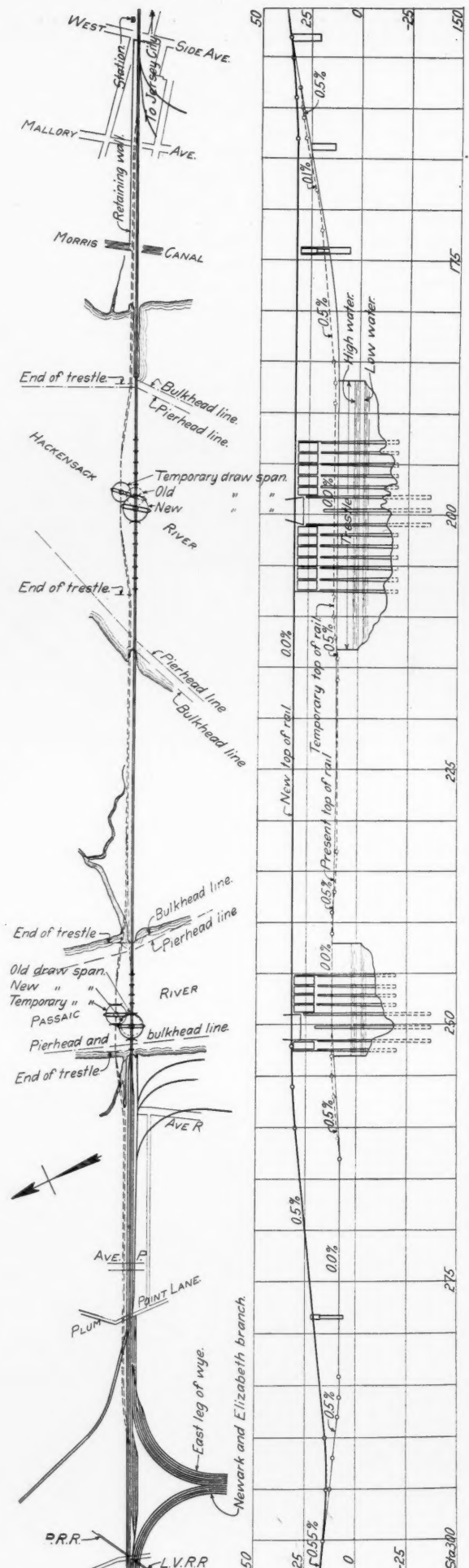
#### CONSTRUCTION OF NEW LINE.

The temporary double track on the new fill was placed as close as a 1:1 slope would allow. The material was kept from overflowing the temporary tracks by crib work laid up by hand of stone picked from the filling material. This stone cribbing sank quite readily into the soft surface of the meadows and no attempt was made to stop it. As fast as it sank additional material was placed on top and the presence of this cribbing below the surface proved very effective in preventing displacement of the temporary track due to upheavals of the soft soil under the load of the new fill. All crowding of the material had to go to the opposite side. In some places it was necessary to limit this spreading on both sides, particularly at a point just west of the Passaic where a manufacturing plant is located very close to the line and considerable damage would have been done by an upheaval of material under the buildings.

The material used for the fill was brought in by scows, being secured from building excavation and disposal stations about New York City. The material was unloaded from the scows to standard gage cars on temporary trestles located on both sides of the Passaic and on the east side of the Hackensack. About 1,500,000 yds. were required for the fill.

#### THE NEW DRAW SPANS.

The new draw spans are exactly alike, being about 250 ft. long overall and providing two 100-ft. channels. Considerable saving was made both in design and erection by the use of identical structures. The Passaic bridge has one girder approach span on the west side and four on the east, and the Hackensack bridge has six approach spans on the west and five on the east. These spans are all deck girders ranging in length from 88 ft. to 110 ft. The piers and abutments are of concrete and ashlar masonry, the latter being used between elevations 2 ft. below low water and 2 ft. above high water as a protection against ice and the action of salt water on concrete. The piers are rounded at both ends. They are supported on piles driven about 40 ft., with a steam hammer and follower,



Plan and Profile of Central New Jersey Improvements Across Hackensack and Passaic Rivers.

the tops of piles being  $1\frac{1}{2}$  ft. above pier footings. The deepest pier is 30 ft. below low water, most of the approach piers extending down from 16 to 20 ft. Cofferdams of Lackawanna steel sheet piling were used for the channel piers and timber dams for the piers in shallow water. The concrete forms were

scows and the mixers were also located on scows. One derrick was used to feed the mixer and another to take the concrete from the mixing plant and deposit it in the piers. The Hackensack bridge required 2,500 piles, 11,000 yds. of concrete and 1,250 yds. of ashlar masonry. The Passaic bridge required



Stone Cribbing Along 20-ft. Fill for New Line.

placed under water and the concrete in the shaft of the pier was deposited by a bottom dump bucket also under water. When concrete had been placed up to an elevation 2 ft. below low water, the piers were pumped out and the ashlar masonry placed in the dry. All concrete material was brought in on

1,700 piles, 8,500 yds. of concrete and 700 yds. of ashlar masonry. In dredging the channels to a uniform depth of 16 ft. below low water, 500,000 yds. of material was removed.

After completing the new pivot piers permanent racks were built on which falsework for the erection of the new swing spans



New Hackensack River Bridge Under Construction; Draw Span Erected in Open Position, Piers for West Approach Being Built in Foreground.

was carried. These permanent racks are of creosoted piles 60 ft. long, the sheathing and clusters being of white oak. All steel was brought in on scows and erected by derricks. The new spans will be operated by Lidgerwood engines.

#### OTHER STRUCTURES.

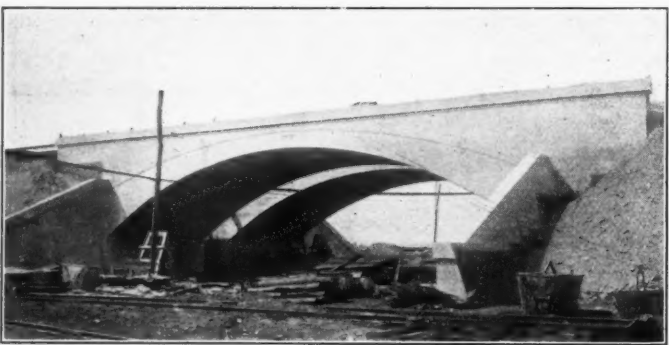
In addition to the two river crossings, the track elevation involved a number of minor structures, three over streets and one over the Morris canal. Mallory avenue, Jersey City, near the east end of the work is crossed by a 60-ft. deck girder, the abutments being built for four tracks and the steel work for two. The Morris canal is crossed on a 60-ft. segmental arch of reinforced concrete which replaces a half-through steel span. In



The New Line Across the Passaic River, Showing Temporary Line to Left.

this case also, the abutments have been built for four tracks. Near the west end of the work Avenue R is crossed on a concrete arch structure consisting of two arches 26 ft. wide with an 8-ft. space between them. A single track will be laid over each of these arches at present, the wide track spacing being provided to allow the building of an island platform for the transfer of passengers. A stairway will extend from the street to this platform between the two arches. If it is desired to add two more tracks in the future, this intermediate space can be filled in by an arch section and the structure will then be of full four-track width. Avenue P is crossed by a four-track steel structure of through girders encased in concrete.

This improvement work was begun in August, 1911. It has been prosecuted continuously since that time and was put in



Double Concrete Arch Structure Over Avenue R.

service October 5, although the work of tearing out the old bridges and finishing some of the minor improvements will not be done before next spring. The entire work was handled under the direction of Joseph O. Osgood, chief engineer, Central Railroad of New Jersey and A. E. Owen, principal assistant engineer. J. J. Yates, bridge engineer was in charge of the design of structures, and L. M. Hannaford was resident engineer on the work. Henry Steers, Inc., New York, was the contractor handling the building of the temporary trestle and the new embankment, moving the draw spans and building the permanent piers and all concrete bridges. The American Bridge

Company fabricated and erected the steel for the two draw spans, Mallory avenue and Avenue P. We are indebted to the engineering department of the Central Railroad of New Jersey for the above information.

## WARTIME RAILROADING IN MEXICO.\*

By MAJOR CHARLES HINE,

Vice-President, Southern Pacific Railroad of Mexico.

For nearly three years past Mexico has suffered from what are politely termed "political conditions." The various participants have expressed their opinions in terms of force and violence. Thousands of lives have been sacrificed; millions of dollars worth of property have been destroyed. Railways have suffered severe losses, both by the destruction of physical property and by the paralysis of revenues, resulting from prolonged interruptions to traffic.

The normal method of procedure includes the burning of all wooden bridges in the theater of operations. The smaller the band, the greater seems its conception of the importance of preventing pursuit by destroying railway bridges. The topography and climatology of Mexico are such that provision must be made for adequate drainage in cases of sudden and severe rainfall. The greater part of these openings are as yet bridged by wooden structures. Traffic can, therefore, easily be tied up and operation nullified by a few bridge burners. The Southern Pacific of Mexico alone has found over 300 bridges burned in the last three years. The number destroyed on the other railways of the republic must run into the thousands.

It may be stated, for easy remembrance, that there are something like 16,000 miles of railway in the republic of Mexico. A little over one-half of this mileage, or something like 8,000 miles, is comprised in the National Railways of Mexico, known among English-speaking people in Mexico as "the merger." This system includes, among other subsidiaries, the old National Railroad of Mexico, the Mexican Central, the Mexican International, the Inter-Oceanic (narrow gage), the Mexican Southern (narrow gage), the Vera Cruz to Isthmus and the Pan American. These various subsidiary corporations are operated under leases and different working arrangements by the National Railways of Mexico, in effect both a holding and an operating company. A majority of the stock of this controlling company is owned by the federal government of Mexico. The bonds are largely held in foreign countries, including the United States. Although certain ministers and officials of the Mexican federal government are ex-officio members of the board of directors, the National railways of Mexico have a working president, E. N. Brown, and all the corporate, executive, general and minor officials usually found on American railways. This unique condition is sometimes described as "government partnership" in contradistinction to the government ownership of other countries.

The next largest railway under single control is the Southern Pacific of Mexico, owned outright by the Southern Pacific Company, and of which 1,250 miles have thus far been finished. The main line of this road is not yet completed. It reached the city of Tepic, the capital of the territory of Tepic, in February, 1912. Previously, some 40 miles had been constructed, north from Orendain Junction, on the National Railways (near Guadalajara, state of Jalisco, the second city in the republic). The above-mentioned "political conditions" have prevented the construction of the intervening portion of approximately 100 miles.

Next in mileage comes the Mexico Northwestern, of approximately 500 miles, owned by Dr. F. S. Pearson and associates, and operated in connection with large lumber mills at El Paso, Texas, at Pearson and at Madera in the state of Chihuahua. This road, lying entirely within the much troubled state of Chihuahua, has probably suffered the greatest percentage of depredations per mile of line of any railway in the republic.

The fourth railway in mileage is the Mexican Railway, some

\*A paper read before the St. Louis Railway Club, October 10.

400 miles, owned by English capital and affectionately called the "Queen's Own." This is the strong line between the City of Mexico and Vera Cruz, a port rich in commerce and famous in history as the three times military base of a conquering foe,—the Spaniards in 1519, the Americans in 1847, and the French in 1862.

The Tehuantepec National, 188 miles long, running from the port of Salina Cruz on the Pacific, to Coatzacoalcas on the Gulf of Mexico, is owned by the Federal Government of Mexico, but is being operated for a term of years by S. Pearson's Sons Company, Limited, who constructed the splendid harbor and terminal facilities at both ends of this shortest of transcontinental lines. A portion of this road forms the connecting link between the Vera Cruz to Isthmus (old Vera Cruz and Pacific) at Santa Lucrecia, and the Pan American at Picacho.

The remaining railway mileage of the republic consists for the most part of small independent branch lines leading to mines and other industries, and in many cases is of narrow gage.

It has been the good fortune of the writer to travel over every mile of main line and over numerous branch lines in the republic of Mexico. While so doing, he has visited 23 of its 27 states, and resided for a period at its capital, the wonderful and fascinating City of Mexico. For nearly two years past, with headquarters at Tucson, Arizona, he has served as the senior vice-president of the Southern Pacific of Mexico, and of the Arizona Eastern. The president of these lines, and their principal builder, is the distinguished engineer and railway executive, Epes Randolph.

In the 20 months since February, 1912, when the second of recent Mexican revolutions was started, the Southern Pacific of Mexico has been in full operation only 6 months. During the other 14 months from 10 per cent. to 80 per cent. of its mileage has been out of commission at various times and in various places. At first the officials, who are all Americans, and the employees who are nearly 90 per cent. Mexicans, strained every nerve to crib bridges and to resume traffic. As time has worn on, however, all reserve energy has naturally been dissipated, the abnormal has become the normal, and the exceptional has lapsed into the routine. A train despatcher is not startled if his wire suddenly goes down before the orders are completed. He knows from experience that the wire may not come up until perhaps tomorrow, next week, or mayhap next month or next year. Occasionally the attacking band will take possession of the locomotive and burn some or all of the cars in the train. Usually, however, in the course of a week or two the wire comes up and a conductor asks for running orders from an office many miles from where last located. Such primitive conditions have developed splendid initiative and resourcefulness on the part of officials and employees of all grades. From the president, who happened to be on the first train held up by armed force, down to the humblest laborer, all have followed Rule L of the standard code, reading: "In case of danger to the company's property, employees must unite to protect it." Ofttimes this has meant dauntless and unflinching exposure to rifle or cannon fire. Habitually, it has entailed inconvenience and physical hardship. Officials who normally use comfortable business cars have taken to small motor cars, to track velocipedes, to push cars, or have traveled many miles on foot. On one occasion the writer's motor car was run by a man who had been a railroader, a frontier deputy marshal, and a chauffeur. For the particular trip in question he united the desirable qualities of a careful motorman, a crack shot and a good cook. The first night was spent in a tool house, one night in a freight house; another in a waiting room and still another in the open country. The car was towed around burned bridges through the arroyos (channels of dry streams).

On another trip a good-sized river had to be crossed, the long trestle approach to the steel bridge having been burned some weeks before. Visions of swimming the river like Funston in the Philippines were ended when the thoughtfulness of an assistant superintendent showed a section gang as water rats

towing a raft made of ties. This interchangeability of function is typical of the all-round training inculcated on the Southern Pacific of Mexico by the unit system of organization. Two years of complete and consistent application of the underlying principles of this rational and practical system have produced gratifying results. Today every department, including traffic and accounting, has available from one to three developed and tested understudies for every official position. Coincidentally during the only period of eight months when conditions approached normal, the operating ratio with normal maintenance charges fell from 97 to 78 per cent.

In May, 1912, after operation of the Sinaloa division had been suspended for over three weeks, it was deemed advisable to move all obtainable equipment north to Empalme, Sonora, near Guaymas, where conditions were tranquil. There were only a dozen locomotives at division headquarters in Mazatlan, Sinaloa, 275 miles south of San Blas, Sinaloa, the north end of the division, and a total of some 500 cars within reach. It was feared that insurrectos might cripple the movement by burning bridges between trains. Not only did bridges have to be hurriedly cribbed, but water tanks had to be repaired, some having been riddled with bullets.

On Monday morning the procession started with a train order reading somewhat as follows: "All engines on division run extra to San Blas with right over all southbound trains until 10:00 p. m. Friday, May 10, and protecting carefully against following trains." Some 60 hours later the senior vice-president, renewing his yardmaster days, tied up the last train on the main track, at San Blas, and then issued an order congratulating the Sinaloa division, through its superintendent, on a performance easy anywhere else, but most difficult under the circumstances.

Regular traffic was not resumed for several weeks. Meantime a "cruiser train" was put on. Passengers rode in the caboose. No cars were left at stations, but freight offered was loaded in empties in the train. After cruising all day, the train tied up wherever night overtook it. The danger of encountering a hole instead of a bridge precludes much night running in times like these.

On March 5, 1913, the state of Sonora revolted against the newly established Huerta government, and seized that portion of the Southern Pacific of Mexico lying north of Empalme. For six weeks the officials of the road were powerless. Operation was carried on from Hermosillo, the capital of the state of Sonora, by the state officials, with six locomotives and other equipment forcibly seized. Methods of alleged confiscation of railway property in the United States are perhaps crude after all. Six weeks of such operation gave the state officials their fill. Outgo so exceeded income that the road was unconditionally returned to its owners.

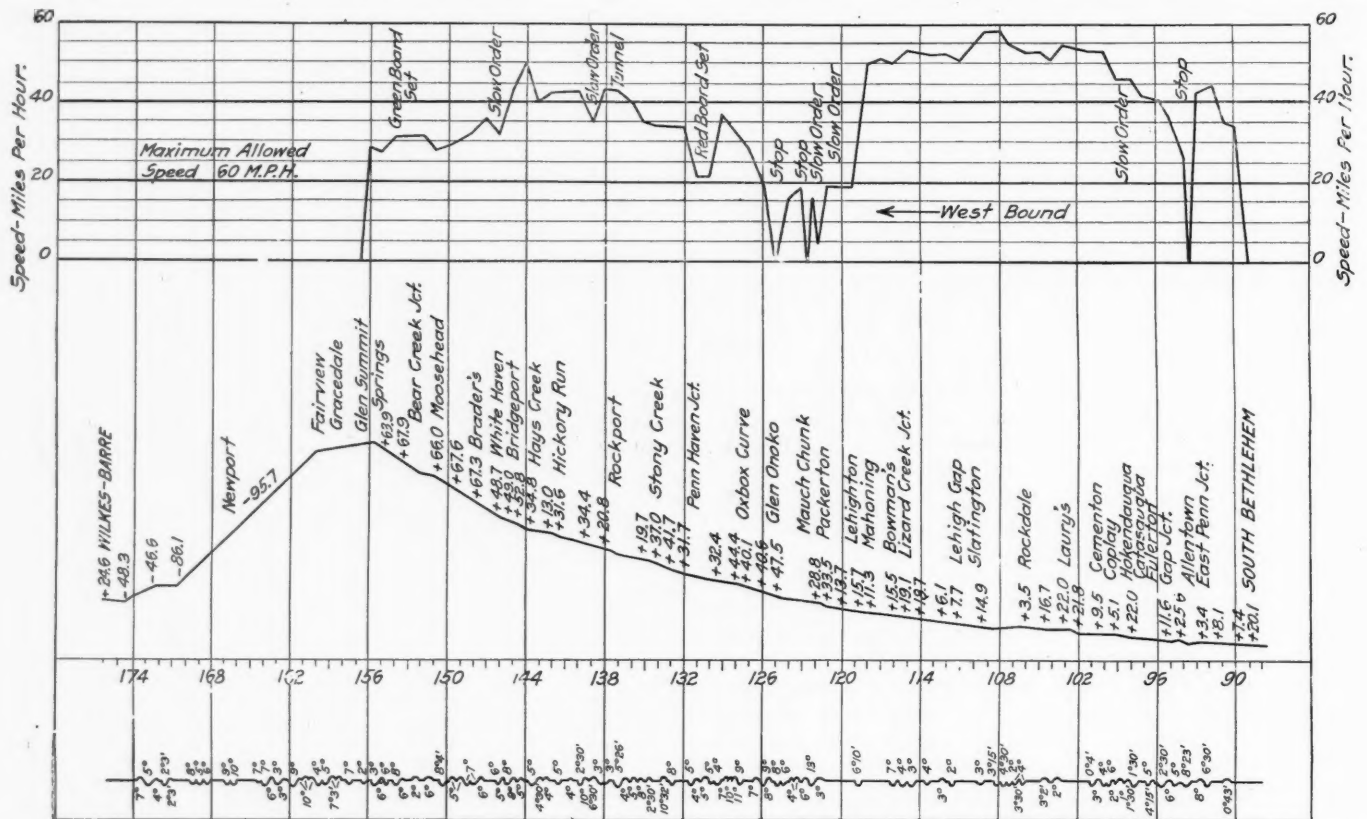
It is not the mission of this paper to discuss the political, economic and military conditions in Mexico, or to venture into the realm of conjecture as to probable outcome. Its main purpose is to record an appreciation of sustained performance, both creditable to the many individuals concerned and so consistent with those high ideals of duty which are characteristic of red-blooded railroad men the world over.

**AUSTRALIAN RAILWAY DEVELOPMENT.**—During the last two years a greater disposition has been shown by the various state governments of Australia to come together with a view to railway construction in border districts. These areas, consisting in many cases of very good land, have been neglected in the past and much inconvenience has been caused through lack of railway communication which would have been provided but for interstate jealousies. Geographically these districts belong to one state, while legally they belong to another. Consequently railway construction in them was neglected. Now, however, it has been arranged to extend several Victoria railways into the southern parts of New South Wales and South Australia, and to connect northwest Victoria with the South Australian lines.

## RECORD OF A LEHIGH VALLEY LOCOMOTIVE.

The new class K-3 Pacific type locomotives on the Lehigh Valley have, since being placed in service, been hauling heavy trains under difficult conditions. These locomotives weigh in working order 262,000 lbs., and have a weight on drivers of 161,900 lbs. The driving wheels are 77 in. in diameter and the

Fairview, at an average speed of 38.1 miles per hour, without assistance. The average grade on this part of the road, which is in the Blue Ridge range in Pennsylvania, is 42.1 ft. per mile and the maximum 67.9 ft. per mile. It will be seen from the chart that between Hays Creek and Bridgeport, where the grade is 34.8 ft. per mile, the speed reached 50 miles per hour. A profile of this section of the Lehigh Valley is shown in the accompanying illustration, which also gives a speed chart. The

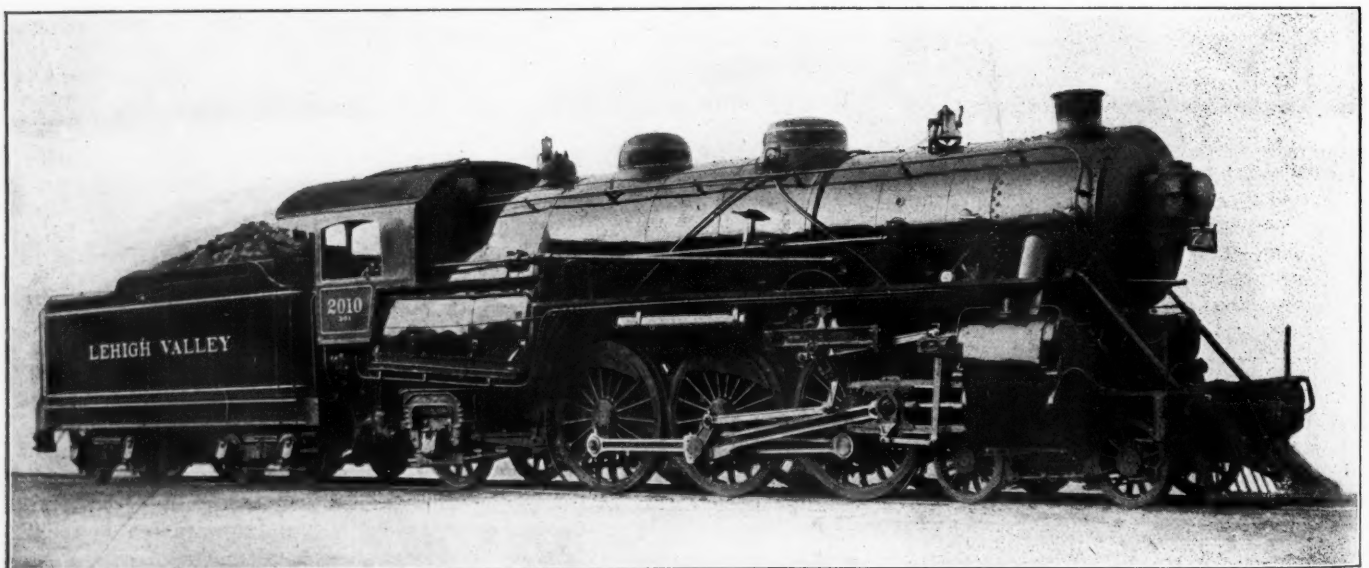


Profile of Part of the Lehigh Valley and Speed Diagram of a Run by a Pacific Type Locomotive Hauling Eight Steel Cars.

cylinders are 25 in. in diameter x 28 in. stroke. The boiler pressure is 215 lbs. per sq. in., and superheaters are used.

On September 6, 1913, locomotive 2010, hauling train No. 9, the Black Diamond Express, an all-steel train made up of baggage-buffet, dining and six Pullman chair cars, eight in all, covered the 24 miles up Mount Nescopee from Penn Haven to

dead weight of the train behind the tender was 603 tons. Using the American Locomotive Company's formula, the tractive effort at Brader's Curve near White Haven, Pa., was 22,540 lbs., or 54.25 per cent. of the maximum tractive effort of the locomotive. These locomotives were designed by the motive power department of the Lehigh Valley.



Pacific Type Locomotive Used in Heavy Passenger Service on the Lehigh Valley.

# RAILWAY FIRE PROTECTION ASSOCIATION.

Organization Formed at Chicago to Study Methods of Fire Protection and Prevention. Abstracts of Papers Presented.

The Railway Fire Protection Association was organized at a meeting at the Hotel Sherman, Chicago, on October 7 and 8, with 40 members, representing the fire protection or insurance departments of as many railways. A constitution and by-laws were adopted, which provide that "The object of this Association shall be to promote the interest in and improve the methods of fire protection and prevention; to obtain and circulate information on these subjects, and secure the co-operation of its members in establishing proper safeguards against loss of property and life by fire, and to standardize practices through the interchange of ideas and experiences with regard to such matters in connection with railway properties."

The action of the association is to be considered advisory and not mandatory. Any representatives of railway companies interested in fire protection and prevention are eligible to membership. The annual meeting is to be held on the first Tuesday in October, the location to be selected by the executive committee, and special meetings may be called by the president or executive committee.

Officers were elected as follows: President, F. H. Elmore, superintendent of insurance, Southern, Washington, D. C.; vice-president, P. Hevener, assistant supervisor of insurance fund, Rock Island Lines, Chicago; secretary-treasurer, C. B. Edwards, fire insurance agent, Mobile & Ohio, Mobile, Ala. Executive committee, R. H. Newbern, superintendent insurance department, Pennsylvania, Philadelphia; Col. B. W. Dunn, chief inspector Bureau for the Safe Transportation of Explosives, Inflammables, and Other Dangerous Articles, New York; B. S. Mace, superintendent of insurance, Baltimore & Ohio, Baltimore; G. G. Tunell, insurance commissioner, Atchison, Topeka & Santa Fe, Chicago; N. Searles, insurance superintendent, Southern Pacific, San Francisco, Cal.; W. S. Langford, insurance department, New York Central Lines, New York.

Following the organization session on October 7, W. H. Merrill, manager Underwriters' Laboratories, Inc., Chicago, gave a description of the work of the laboratories, after which the members paid a visit to the plant to witness some tests arranged by Mr. Merrill.

The program on Wednesday morning included nine papers and addresses. Abstracts of the principal papers are as follows:

## FIRE PROTECTION.

Charles N. Rambo, superintendent, Mutual Fire, Marine and Inland Insurance Company, presented a paper on "Fire Protection Applied to Railroad Properties."

The subject of fire protection in a broad sense includes that of fire prevention which concerns the removal of the causes of fires. The essential features to be considered by those who study the problem of fire protection are:

First, to so construct buildings on fire-resisting lines as to minimize the possibility of fire starting and prevent its unrestricted spread and opportunity for serious loss. The proper time to guard buildings against loss by fire is during their construction. One of the reasons why this is not always done, unfortunately, is on account of the initial cost. We must encourage the use of fire-resisting materials, the division of large areas as far as possible and the protection of buildings exposing each other. We have too frequently seen a class of buildings on railroads that is apt to furnish fuel for large conflagrations.

Second, to prevent fire from starting through the reduction and safeguarding of hazards inherent to the particular

property. Elimination of the possibility of fires starting should be as carefully considered as the question of good construction and protection.

Third, to provide adequate private and public facilities for extinguishing a fire should it start and be prepared to fight a small fire before it becomes dangerous. All of the expense for the installation of fire fighting equipment, water supplies, etc., is of no avail, however, if the means to promptly use it is not trained and ready, and if it is not properly cared for and kept in serviceable condition.

One of the first demands in connection with the study of fire prevention is that of good housekeeping, involving a multiplicity of detailed enforcements that will insure it through a large property as a matter of daily duty and through which means the possibility of fires may be largely avoided. This can be accomplished by the appointment of employees in each portion of a property with such authority as may be necessary, to see that cleanliness is observed and through the posting of official notices in prominent places requiring the carrying out of fire protection rules so prepared as to meet conditions usually found in railroad properties.

The protection of properties against fire is an important part of the duty of every officer and employee. Every fire in railroad property should be made the personal responsibility of some employee. It must be remembered that the majority of fire losses are preventable and that they are largely a matter of lack of cleanliness and carefulness, and that the great study of prevention must be along those lines.

A very good classification of hazards, recently made by a prominent insurance official, divided them into physical, moral and temperamental. Those which are particularly applicable to railroad properties, I believe, are the physical hazard and the temperamental hazard; the first including such as are inherent in the property and its use, such as construction and the hazard of operation; the second including that which would be attributed to carelessness which produces fires, not purposely, but those which could have been prevented by a study of the causes of fires, with less indifference as to the effects which follow or as to the remedies to be applied.

With the consideration of the subject of building construction and the careful and systematic guarding of the housekeeping and operation to reduce or avoid hazards, we include that of fire extinguishing apparatus. This subject necessarily is one of great detail and brings out the study of the extent and character of the properties and the natural conditions surrounding them, and their use and occupancy. The class of appliances will necessarily cover a wide range, starting, however, with the idea of having an ample supply of water to meet the maximum conditions that might arise. Careful study is necessary to determine the specific character of fire extinguishing devices required to meet the demands of each class of property. These include the use of a system of automatic protection which is the best class that may be considered, and which is recognized as the only one producing the maximum of efficiency and success in controlling fires; water mains and fire hydrant systems under ample volume and pressure from public or private reservoir or other source of supply, with incidental fire pumps, elevated tanks, standpipes, fire hose, fire extinguishers, steam jets, sand pails, water barrels and pails; all of which must be studied and installed with a due regard to their relative values. An important fire fighting agency on railroad properties is the locomotive or yard engine used at terminals and large yards

remote from public protection so equipped for supplying water with the aid of fire hose as to give good service in event of fires in rolling equipment and its lading.

Fire alarm systems are an important factor, particularly in large properties, to obtain prompt use of fire appliances through the prompt summoning of drilled employees and municipal departments. The success of the fire prevention idea must be due largely to well organized forces in all departments. Without system and organization through the help and authority of executives or the general management, such matters cannot be made an important factor with the men. The prevention of the occurrence of those things which hinder or retard the progress of operation or which are a menace to life and property is brought about or is reduced by education through instructions, rules, etc., issued under an executive order. In this way co-operation is secured amongst the rank and file.

Fires, like accidents, happen at unexpected times. Continued vigilance is therefore essential, and without a general co-operation and knowledge of dangers we cannot escape their consequences. The organization of the fire prevention and protection work on railroads must be undertaken with intelligence and a due regard to local conditions. It is necessary that the importance of the work be recognized by all in authority, the chief executives, the general manager, superintendents, foremen and agents in charge of property; all educated to the idea that there should be harmony of action. Education as to fire prevention requires thorough publicity that all employees may be advised of its scope and that it may reach all parts of a system and that the old and prevalent idea of security against fire damage may be eliminated.

Fires, even though promptly discovered, can very often not be handled by employees because of lack of fire fighting equipment or lack of knowledge of how to handle it, and because it is quite usual in such contingencies for people to "lose their heads." Fires have to be scientifically and carefully sought out and fought. Experience has shown that the efforts of undrilled employees, however well intended, will not control a fire as promptly as a disciplined force, made familiar with the protective apparatus by regular drill and practice.

Rigid and systematic inspection of all fire apparatus should also be made by specially delegated employees, preferably members of fire brigades, at least once a week; everything down to the smallest piece of apparatus should be in its place and in good order ready for use, and a report of such inspection should be made to those in authority.

Fire prevention committees, fire marshals, chiefs or captains of fire brigades are all necessary parts of an efficient organization, and the inspection of buildings and their valuable contents for fire hazards by such committees or members of fire departments should not be treated in any light manner. Members of fire departments, possibly uniformed or otherwise designated with authority, should be especially delegated to make at least weekly inspections and report to the authorities in charge on the conditions, and day and night watchmen should patrol all parts of the property for the same purpose, having their tours properly recorded on approved devices, to assure efficiency.

There should be monthly conferences of officers or local committees at which matters of general interest might be considered with a view of continuing efforts for substantial improvements, for with all reasonable precaution there is still the factor that relaxation may be fatal.

In passing I might add that the improved construction in railway rolling equipment should eventually work a great factor of saving in the loss by fire on railroads, for a large part of their loss has been brought about through inflammable construction of equipment and character of its lading. With the reduction in the amount of inflammable equipment, and safer methods of transportation in connection with haz-

ardous commodities under direction of the Bureau of Explosives, fires may be restricted in large congested yards.

#### CAUSES OF FIRES.

E. B. Berry, chief inspector, Southern Railway, Washington, D. C., presented the following paper on "Causes of Fires":

We must gain a thorough knowledge and understanding of the cause or origin of fires before we may deal with the subject of fire prevention. I have not been able to secure sufficient data to present an exhaustive report, but I have the fire records of three of the larger railroads covering a period of two years which show 4,275 fires, with a loss of \$1,810,000.

Eliminating 285 fires, charged to miscellaneous origins, such as boiler explosions, friction from brake shoes, hot journals, etc., all of which are causes of infrequent occurrence, there remain 3,990 fires, or 93 per cent. of the total number, with a loss of \$1,580,000, which originated from 18 causes. These causes are mentioned in the order of their importance.

1. 1784 fires, 41 per cent., with a loss of \$52,000, were caused by loading hot cinders into cars, which includes the slacking of lime in trash cars.

2. 707 fires, 17 per cent., with a loss of \$200,000, were caused by flying sparks.

3. 503 fires, 8 per cent., with a loss of \$298,000, were charged to an unknown origin.

4. 213 fires, with a loss of \$136,000, were caused by the burning of adjacent property.

5. 156 fires, with a loss of \$46,000, were caused by defective heating appliances, or careless handling of same.

6. 68 fires, with a loss of \$23,000, were caused by defective lighting appliances, or the careless handling of same.

7. 148 fires, with a loss of \$240,000, were charged to wrecks.

8. 130 fires, with a loss of \$77,000, were caused by live coals dropped by engines.

9. 67 fires, with a loss of \$64,000, were charged to incendiarism.

10. 59 fires, with a loss of \$57,000, were caused by the careless handling of torches and open lamps.

11. 47 fires, with a loss of \$66,000, were caused by tramps.

12. 42 fires, with a loss of \$13,000, were caused by spontaneous combustion.

13. 30 fires, with a loss of \$30,000, were caused by friction matches.

14. 16 fires, with a loss of \$34,000, were caused by smoking.

15. 15 fires, with a loss of \$9,000, were caused by careless burning of grass and rubbish around tracks and building.

16. 4 fires, with a loss of \$90,000, were caused by overheated boilers.

17. 2 fires, with a loss of \$140,000, were caused by oily waste and wooden lockers.

18. 2 fires, with a loss of \$9,000, were caused by defective insulation of oil burning forges.

I have examined records of my own road for the past ten years, and have looked over a few records of other roads, and I am of the opinion, if all the railroad fire records were examined, the 18 causes mentioned would be found to be the origin of 75 per cent. of the fire loss on railroads. I will venture to say further that losses charged to each of the 18 causes will be approximately uniform each year. In other words, it would seem entirely proper to charge a specific annual loss to each of these 18 causes. Of the 3,990 fires attributed to the 18 causes, 76 per cent., or 3,255 fires originated from avoidable causes, which in the last analysis means nothing more than carelessness.

I desire to dwell for a moment on fire losses caused by flying sparks and fires reported of an unknown origin. Under the first class, there were 707 fires, with a loss of \$200,000. We know that engines cannot operate without throwing

sparks, and under the most favorable conditions, certain fire losses are unavoidable. I believe, however, that losses from this cause can be very much reduced. Seven or eight years ago, cotton fires on the Southern reached an annual loss of \$100,000 to \$150,000. Something had to be done, and after a conference of the inspection department, special cotton inspections were inaugurated. Each cotton point was visited, conditions investigated, agents cautioned as to the danger from flying sparks, and their co-operation requested. Fire protection apparatus was kept ready for instant service, and engineers were instructed to pass cotton platforms without working steam. Superintendents were instructed to make a special effort to get all cotton loaded before night, and to see that cars were in good condition, with doors securely closed, stripped and cleated. These efforts reduced cotton losses from the value above to \$25,000 to \$40,000. Recently, this special work has been augmented by placing watchmen on platforms where 100 or more bales would remain on hand over night. The first year of this additional protection resulted in a fire loss of less than \$5,000, while handling in the neighborhood of 2,000,000 bales of cotton.

The fires reported as of unknown origin numbered 503, with a loss of \$298,000. What progress in fire prevention can be made without knowledge of the cause of fires? I believe that when an investigation is intelligently conducted, a positive origin, or at least a probable cause may be found. When we visit a fire, if the cause is not at first apparent, we may by a process of elimination, get down to a probable cause, and I believe it far better to do this than to report a fire "origin unknown."

#### RESULTS GAINED WITH SPARK ARRESTERS ON THE NORTH WESTERN.

H. T. Bentley, assistant superintendent of motive power and machinery, Chicago & North Western, gave a brief description of the Mudge-Slater box front end spark arrester, which has now been installed on 1,660 of the company's locomotives, all except the oil burners. This device, which was described in the *Railway Age Gazette* of November 1, 1912, page 846, had been invented by one of the company's master mechanics to overcome the difficulties encountered with the Master Mechanics' front end, which was so constructed that sparks could easily escape after the various parts had been warped by heat. After a test was made on November 25, 1910, all the company's locomotives operating in Wisconsin were equipped with the device, and since then it has been gradually applied to the others. During the year ending June 30, 1911, during which only a few of the locomotives were so equipped, the company paid \$129,205 for fire claims caused by sparks. In 1912 the amount had been reduced to \$63,707, and in 1913, to \$15,638.58. For two years the company has not had a fire caused by a locomotive in Wisconsin, and with the new device much less coal is required than before.

#### COL. DUNN'S ADDRESS.

Col. B. W. Dunn outlined briefly the history and work of the bureau for the safe transportation of explosives, and declared that the bureau and the new association could render each other a great deal of assistance by co-operating. He said the time has come in the history of railways when it is necessary to reduce every unnecessary expense, and to increase efficiency in every possible way. There is but one method left to curtail expenses, and that is to eliminate wastes. The movement for the safe transportation of explosives, and for the prevention of fires is the railways' answer to their critics among the public. The success of such movements depends on getting down to the detail causes and finding a remedy for them. In order to eliminate unnecessary losses it is necessary to first get accurate data to show what the losses are. Such data is now available in the case of losses caused by explosives, but are not so complete in a case of losses caused by acids and inflammables, and the membership of the Fire Protection Associa-

tion can render a great deal of assistance to the bureau by helping to obtain complete information to be reported to the bureau.

Anson Murphy, chief inspector, Alabama Great Southern, presented a brief paper on "Construction of Buildings," emphasizing the importance of considering fire protection in the construction and laying out of buildings.

A. D. Brooks, supervisor of fire protection, Illinois Central, presented a paper on "Spark Hazards," in which he stated that the greatest source of fire loss in connection with railway property is the company's buildings located within the range of the spark. Birds' nests, poorly shingled roofs, open joints or decayed parts which form pockets for catching the sparks present the worst conditions in such buildings. Quoting from a statement compiled from tests by Dr. W. F. M. Goss, in regard to the throwing of sparks along the right of way, he stated that the greatest number of sparks fell at from 30 to 150 ft. from the center of the track; that very few sparks fell from 15 to 20 ft. of the track, and that beyond 150 ft. from the center of the track sparks were of such character as to preclude any possibility of fire. However, sparks from fixed fires made on the right of way, when fanned by a strong wind may cause fires at a distance of several thousand feet.

Mr. Brooks stated that in his territory the fire losses for one year averaged \$27 per locomotive, or 0.003 cents per locomotive mile, making a total of \$83.50 per day. These losses include fires due to sparks from the ash pans, as well as the smoke stacks. Since the slide bottom ash pan has been installed these fires have increased approximately 50 per cent., due to the ash pans not being completely closed. To overcome this trouble the engineers are being held personally responsible for their proper adjustment. There were 52 fires from this cause, with approximate loss of \$117 per fire.

There were 61 fires caused by sparks from the smoke stack, having an average loss of \$400.12 per fire, or 10 per cent. of the exposed value. A comparison of four years' records shows a reduction of 45 per cent. in fires, and 39 per cent. in fire losses. In some cases it has been found necessary to treat the claimant with his own medicine. One instance was where an orchard had sustained a total loss for several years, due to fire being set by the locomotive. This was overcome on settling the claim by chopping down each tree when the claim had been settled, and the story goes that the loss was canceled after several trees were sacrificed. It was also pointed out that with better combustion in locomotives less sparks are likely to be emitted from the stack, and a coal burning to a low ash would be less liable to pass off sparks than one burning to clinkers.

P. Hevener, assistant supervisor of insurance fund, Rock Island Lines, presented a paper on "How Locomotives May Be Used to Extinguish Fires," in which he described the locomotive fire extinguisher made by the Nathan Manufacturing Company, and the arrangement that is used on the Rock Island Lines. The latter extinguisher was originated by one of the master mechanics on that line, and consists of a Y-fitting placed in the feed pipe on each side of the engine. Each engine so equipped is also provided with a 50-ft. length of 2-in. unlined linen fire hose with couplings and nozzles, which is kept in a box located underneath the running board. As all of the Rock Island engines are equipped with combined stop and check valves there is no special valve placed between the Y-fitting and the check valve for closing the connection to the boiler. The hose is coupled on to one leg of the Y, which is sealed when not in use by a cap having a finished seat bearing on the end of the fitting. When working as an extinguisher the water is injected into the hose instead of into the boiler, and while it is expected that this water will be rather warm, it is not hot enough to do any damage, and the nozzles may be easily handled with gloves. This device has been used with great success in the yards and terminals, and has saved several hundred thousands of dollars of fire damage. About 250 switch engines have been equipped with this device, which costs only \$45 per engine. In the larger yards and ter-

minals of the Rock Island the enginemen and trainmen are drilled to respond to alarms quickly, and periodical tests are made not only to insure that the device is in good working order, but to familiarize the yard employees with its use.

B. S. Mace, superintendent of insurance, Baltimore & Ohio, discussed the subject of "Fire Organization," reading the rules and regulations of the fire organization on his road.

The executive committee announced the appointment of four committees to report at the next annual meeting: Fire Hazards, Charles M. Rambo, chairman; Statistics and Forms, B. F. James, Colorado & Southern, chairman; Fire Fighting Organizations, E. B. Barry, Southern, chairman; Fire Fighting Apparatus, B. S. Mace, Baltimore & Ohio, chairman.

After the adjournment at noon on Wednesday the members witnessed a test made with the Pyrene fire extinguisher, manufactured by the Pyrene Manufacturing Company, New York, at the Twenty-seventh street roundhouse of the Illinois Central. A 330-lb. bale of cotton was burned for 1 hour and 10 minutes with hot coals, which burned a hole 6 in. wide by 26 in. deep. Three pints of Pyrene were used and 24 minutes later when the bale was opened the fire had been entirely extinguished.

### CONDITIONS OF COMPETITION FOR THE E. H. HARRIMAN MEMORIAL GOLD MEDAL.

As previously noted in the *Railway Age Gazette*, in order to create a better understanding on the part of the public as to what railways are doing to make safer conditions of travel and to safeguard their own personnel, through the prevention of accidents and the provision of the best methods of hygiene, Mrs. E. H. Harriman, about the first of the year, offered a gold medal to be awarded annually by the American Museum of Safety to the American steam railway making the best record of accident prevention and industrial hygiene affecting the public and its own personnel during each current year.

The gold medal is to be awarded to the railroad company itself, a replica in silver to the member of the operating department of that road who has done the most to bring this condition about, and a replica in bronze to the employee of the winning road who has been most conspicuous in the promotion of safety by suggestions or otherwise. The committee to award the medal appointed by the trustees of the American Museum of Safety has been changed since the original announcement, and is now constituted as follows:

Arthur Williams, President American Museum of Safety, Chairman; W. F. Allen, Secretary American Railway Association; Edgar E. Clarke, Chairman Interstate Commerce Commission; Samuel O. Dunn, Editor *Railway Age Gazette*; Charles P. Neill, Former United States Commissioner of Labor.

The first medal is to be awarded in January, 1914, for the year ending June 30, 1913. The award committee has recently formulated the conditions of competition and sent blank forms to the railway companies on which to make the returns on which the award will be based. These forms ask information as to the total locomotive miles run and the number of persons killed and injured, as well as the number killed and injured per million locomotive miles run, under the heads of Casualties in Train Accidents, and Casualties in Other Than Train Accidents, (excluding industrial accidents), for passengers, employees and other persons (not trespassing). Additional data is asked for industrial accidents (not involving the movement of engines or cars) to employees.

In formulating the conditions of competition the committee has decided on the following points, among others:

In making the award, consideration will be given to the system units under the jurisdiction of a single president.

Locomotive miles run is the total of all revenue and non-revenue mileage made by locomotives in all classes of service, except construction service.

Number of employees for computing rate per 1,000 in industrial accidents is determined by dividing the aggregate days worked by all employees in industrial service, such as trackmen, shopmen, freight handlers, and others not actually engaged in the operation of trains, by the number of working days in the period covered by the report.

Killed: Accidents to persons resulting in immediate death or in death within 24 hours from the time the accident occurred should be reported in column headed "Killed."

Injured: All other accidents to persons, including those resulting in death of the person injured after interval of more than 24 hours from the time the accident occurred, should be reported in the column headed "Injured." Accidents to employees should not be reported if they result in injuries so slight as not to prevent the employee injured from performing his accustomed service for more than three days, in the aggregate, during the ten days immediately following the accident. Injuries to passengers and other persons that do not prevent the injured person from following his customary vocation for more than one day should not be reported.

In order to assign varying weights to accidents, in view of the fact that the obligation of the carrier to the passenger is of a higher order than its obligation to the employee, the committee will employ the following factors by which the number of accidents per million locomotive miles will be multiplied in determining the relative standing:

Multiple to be applied  
to number of accidents  
per 1,000,000 locomotive  
miles and industrial acci-  
dents per 1,000 employees.

	Killed.	Injured.
Passengers in train accidents.....	200	4
Employees in train accidents.....	80	2
Other persons in train accidents.....	80	2
Passengers in other than train accidents.....	100	2
Employees in other than train accidents.....	40	1
Other persons in other than train accidents....	40	1
Employees in industrial accidents.....	40	1

By adding the products of accidents per million locomotive miles run, a weighted scale will be obtained and, other things being equal, the carrier with the lowest record would show the highest measure of safety. However, other things would never be equal, and the weighted scale will be only one of the elements to be taken into consideration by the award committee. The committee will, with the assistance of the scale above referred to, consider the following:

(a) The aggregate traffic handled by a carrier measured in tons carried one mile and passengers carried one mile.

(b) The precautions that have been taken by the carrier to protect life and limb, such as:

1. Installation of block signals.
2. Interlocking plants.
3. Highway crossing gates, and signals.
4. High standard of maintenance of equipment and track.
5. Safety devices in shops.
6. Installation of hospitals, hospital cars and emergency hospitals to alleviate injuries and save life.
7. The institution of surprise tests to promote and check discipline.

8. The encouragement of safety committees amongst employees, and in fact every other item pertinent to securing the safety of life and limb as to which the management of a railroad owes the highest degree of care.

The award committee will also take into account all pertinent data, and those competing for the medals are asked to specify in considerable detail what information outside of the tabular statement of accidents they can furnish for the use of the committee. It is particularly desired that, under the head of general information, the committee should be informed as to the control of communicable diseases and the general sanitary measures for employees and for passengers. It is possible that the committee may in correspondence ask for additional data to assist them in reaching a conclusion. Returns will cover the year ending June 30, 1913, and are to be in the hands of the chairman of the committee not later than November 1, 1913.

## B. & O. ENGINE TERMINAL AT CUMBERLAND, MD.

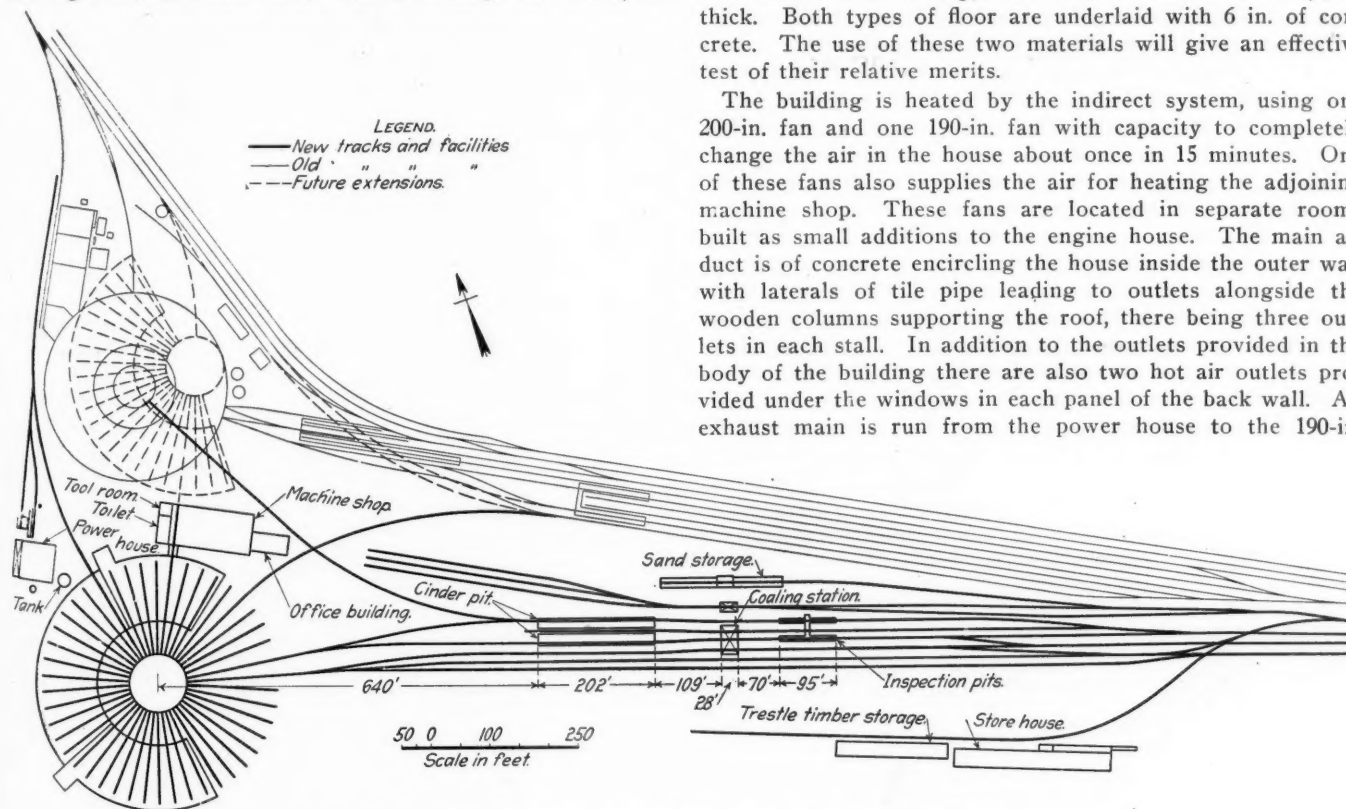
Construction of a Complete Mechanical Terminal Including  
a 31-Stall Roundhouse Designed for Mallet Locomotives.

The Baltimore & Ohio's engine terminal for the district lying west of Washington and Martinsburg is located at Cumberland, Md., which is at the foot of the eastern slope of the Allegheny mountains near the convergence of the lines from the west. Both passenger and freight traffic through this point is extremely heavy, and practically all of the locomotives used in this territory are of the Mallet and heavy Mikado types in freight service and the heaviest Pacific type in passenger service. The old engine terminal had become entirely inadequate to properly take care of the heavy locomotives, and this situation was rendered more acute by the extremely cold weather that prevails for relatively long periods. Sufficient ground space for a new terminal was available alongside the old facilities. The improvements which have been completed consist of a roundhouse with a 100-ft. turntable, a double cinder pit, a reinforced concrete coaling station, a sand house and a small power house, all

On account of the fact that the engines handled are principally Mallets, Mikados and large Pacifics, the engine pits are made 88 ft. long with side pit walls of sufficient width to provide bearing for jacking for a distance of 40 ft. on the inner ends of the pits. The pit walls are extended 12 ft. outside of the house to prevent track settlement. To facilitate handling repairs to Mallet engines, twin driving wheel drop pits are provided under four stalls, and truck wheel drop pits under two stalls. These pits are furnished with hydraulic pneumatic jacks of 30 tons and 15 tons capacities respectively. All pits are drained by a special sewer system which returns the water to a central reservoir from which it is taken for use in the boiler washing system. Each of the stalls is provided with a smoke jack made of Trammite supported on a wooden frame with hoods 4 ft. x 12 ft. long.

One-half of the floor wearing surface is of creosoted wooden blocks 3 in. deep, and one-half of mastic rock 1½ in. thick. Both types of floor are underlaid with 6 in. of concrete. The use of these two materials will give an effective test of their relative merits.

The building is heated by the indirect system, using one 200-in. fan and one 190-in. fan with capacity to completely change the air in the house about once in 15 minutes. One of these fans also supplies the air for heating the adjoining machine shop. These fans are located in separate rooms built as small additions to the engine house. The main air duct is of concrete encircling the house inside the outer wall with laterals of tile pipe leading to outlets alongside the wooden columns supporting the roof, there being three outlets in each stall. In addition to the outlets provided in the body of the building there are also two hot air outlets provided under the windows in each panel of the back wall. An exhaust main is run from the power house to the 190-in.



Plan of New B. & O. Engine Terminal at Cumberland, Md.

conveniently arranged and embodying an up-to-date locomotive terminal with buildings and other facilities of permanent construction.

In order to accommodate the large Mallet locomotives the length of the roundhouse was made 110 ft. There has been constructed at this time 31 stalls and space is left for further extension. A 100-ft. deck type turntable is used. The building has brick walls on concrete foundations, with timber roof posts and beams supporting a wooden roof. The rear wall of the house is made up of brick pilasters with broad window spaces between with top and bottom sash counterbalanced. The roof line is broken at the first row of posts near the front of the building so as to give a row of sash with narrow vertical louvre over each stall to provide light and ventilation. The locomotive door openings are fitted with wooden rolling doors of improved type which can be repaired at minimum cost when accidentally damaged.

fan so as to permit the use of such exhaust steam as may be available, but in the main, heat is supplied by live steam. All piping for the boiler washing system and for the steam, water and air service is brought from the power house through a short tunnel, but distribution in the house is overhead. The building is lighted by 60-watt Tungsten lamps. Five of these are placed in each stall.

Closely adjacent to the engine house and connected to it by a covered passageway, carrying a track connecting to one of the stalls of the roundhouse, is a machine shop 70 ft. x 140 ft. Machine tool equipment is installed for taking care of light running repairs including a driving wheel lathe. The machine tools are driven by electric motors. The shop is heated and lighted the same as the roundhouse.

At the west end of the shop in a separate room toilet facilities for the men are provided. At the east end of the machine shop and attached to it is a two-story office build-

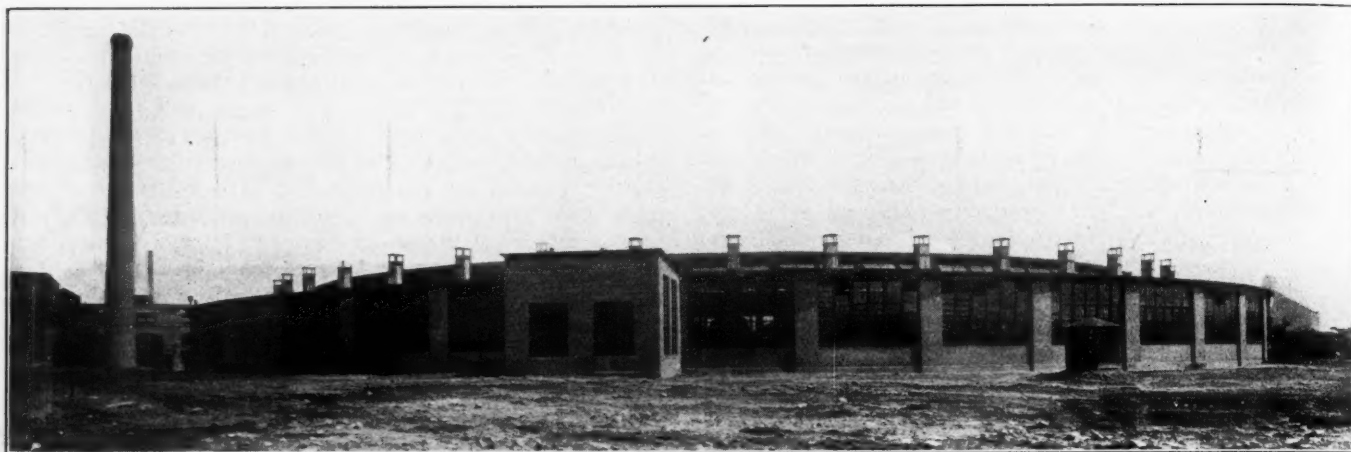
ing about 33 x 64 ft. This is a brick building divided by lath and plaster partitions into rooms for the master mechanic, road foreman of engines, roundhouse foreman, storekeeper and clerks, also the engine despatchers' room with train board. This building is lighted by Tungsten lamps and heated by direct steam heat.

The power house building, located nearby, is about 67 ft. x 65 ft. and is divided by a longitudinal partition into a boiler

room and an engine room. Current for power and lighting is furnished from an outside source. The engine room equipment consists of one 1,000-ft. air compressor, a large fire pump, three 50-kw. 2,200/440-volt transformers for power purposes, one 50-kw. and one 25-kw. series arc transformers for lighting purposes, and a six-panel switchboard. In the basement at one end of the engine room are located the boiler washing pumps. The boiler room equipment consists of two batteries of water tube boilers aggregating 1,000 h. p. The

boilers are fitted with automatic stokers to which the coal is delivered by gravity from an overhead bunker. The coal is dumped into a hopper outside of the power house and is lifted with a bucket elevator onto a belt conveyor and discharged into the bunkers by means of an automatic tripper. Ashes are removed by hand.

The cinder pit is located between the coaling station and the engine house. This is a double pit of the submerged



Rear View of Roundhouse.

room and an engine room. Current for power and lighting is furnished from an outside source. The engine room equipment consists of one 1,000-ft. air compressor, a large fire pump, three 50-kw. 2,200/440-volt transformers for power purposes, one 50-kw. and one 25-kw. series arc transformers for lighting purposes, and a six-panel switchboard. In the basement at one end of the engine room are located the boiler washing pumps. The boiler room equipment consists of two batteries of water tube boilers aggregating 1,000 h. p. The

type, having an overhead traveling crane with a grab bucket. The cinder pit stands practically full of water at all times. Into this the cinders are dumped and loaded by means of the grab bucket into cars standing on a track between the two ash pits. About 120 engines are handled over this pit daily. The economy of loading the cinders may be judged by the fact that one man working during the daylight hours only is able to load all the cinders.

The coaling station is located, as stated, in advance of the



Clinker Pit and Coaling Station.

cinder pit. The structure is of reinforced concrete with bunker capacity for 600 tons of coal. The bunker is divided into four bins to handle three sizes of coal; run-of-mine, crushed coal for locomotives equipped with stokers, and special coal for passenger locomotives. As the greatest consumption is run-of-mine coal two of the bins are used for storing this size. It is arranged to deliver coal to locomotives on four tracks passing beneath and along one end of the station. Run-of-mine coal can be taken on any one of these tracks, while on two tracks passenger coal can be taken and on another the stoker coal. The locomotive coal is received on a track passing one end of the station, the coal being dumped from the cars into a concrete pit and elevated by an inclined balanced skip hoist. The two skips are of 5 tons capacity each, and capable of elevating 125 tons of coal per hour. The electric motor operating the hoist is controlled automatically.

Provision is made for overhead storage of 20 cu. yds. of dry sand with suitable pipes for delivering it to the locomotives on any one of the four tracks. Green sand storage of about 1,200 cu. yds. is provided in a sand house near the coaling station. The sand is dried by steam driers and elevated into overhead storage bins by compressed air.

All buildings are completely encircled by a 6-in. fire line



Interior of Roundhouse.

supplying fourteen 4-in., two-way fire hydrants. An outfit of hose is stored in suitable hose houses in strategic locations. This system is supplied by the fire pump in the power house having a capacity of 700 gals. per minute on which steam is kept at all times. About 3,000 ft. of water pipe, varying in size from 10 in. to 14 in., was laid for supplying three penstocks. This was connected to existing water tanks and a 12-in. branch furnishes the power house with water.

This terminal was designed and constructed by Westinghouse, Church Kerr & Company, New York, under the direction of M. A. Long, assistant to chief engineer of the Baltimore & Ohio.

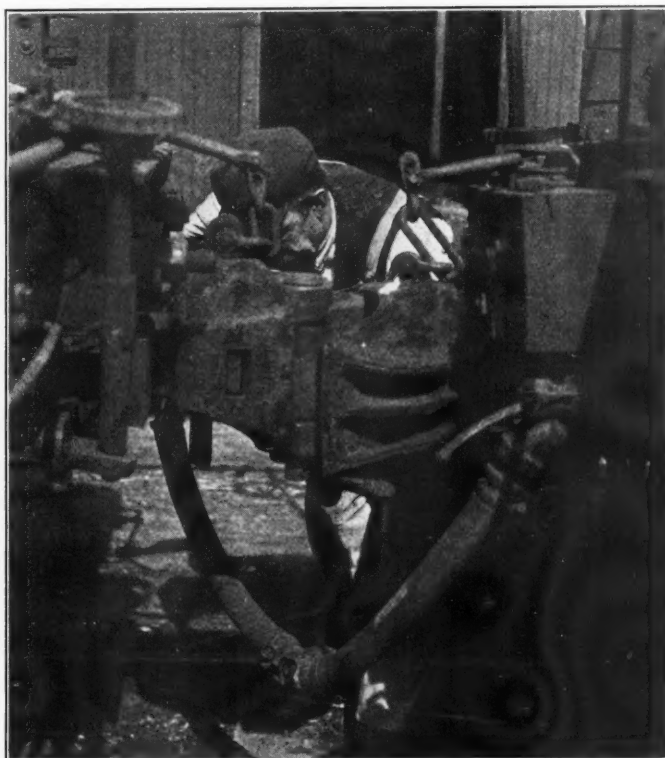
**THE ABANDONED ARGENTINE RAILWAY FUSION.**—The minister of public works in Argentina, discussing the decision of the Buenos Aires Great Southern Railway and the Buenos Aires Western Railway to withdraw their petition for amalgamation, said he considered that the matter was finished and would leave no evil effects. The government would always support private railways, and would maintain with these great companies the same excellent relations as in the past.

## AIR BRAKE HOSE.

By J. S. SHEAFE,

Engineer of Tests, Illinois Central, Chicago, Ill.

The general attention which has been given to the air brake hose question has resulted in a closer scrutiny of all failed hose. On every railroad almost daily reports are received of damage resulting from burst hose, and managers are asking the mechanical department, "Why?" Varying answers are given. The most popular explanation has been, poorer quality in air brake hose; other reasons are, higher train line pressure, imperfect workmanship, too little money paid to insure a good article, etc. From 30 cents a foot, minimum, to 65 cents a foot, maximum, is paid for air brake hose. The normal price now for a first class hose is approximately 40 cents a foot, so we may expect that in the first case the 30 cent man is using cheap material; the 65 cent man is using the best in the market and producing a hose which should give corresponding service. Here is the paradox; after exhaustive inspection and recording of the performance of thousands of air brake hose, it was found that the 30 cent hose had a better



In Reading the Present Hose Label a Man Occupies a Dangerous Position.

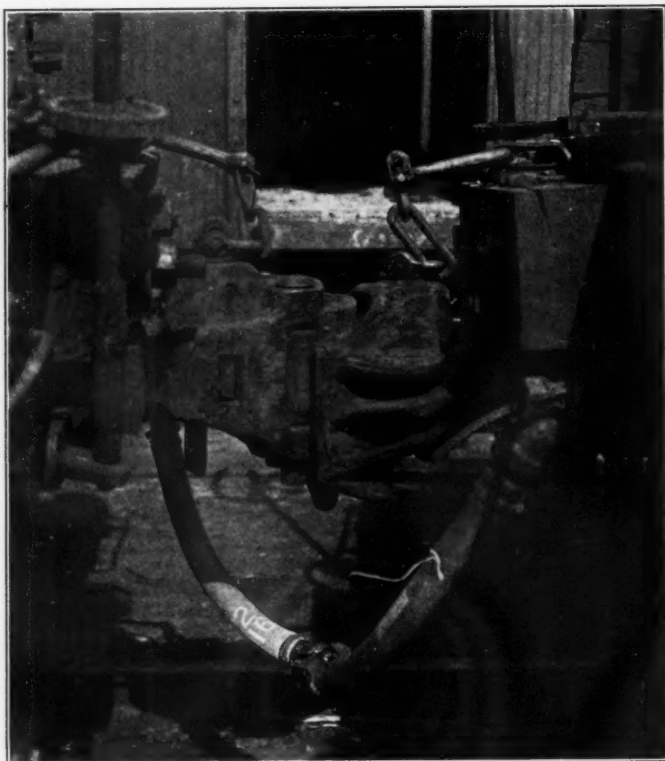
record than several higher priced ones and was well up in its performance; it was slightly above the general average of all the hose examined. The high priced hose did not give any considerable increase in service. A price of approximately 65 cents a foot is asked by the manufacturer because he is compelled to meet certain specifications. Whether or not such a hose is worth the difference is questionable, and a matter of opinion. There is no evidence at hand showing that it is worth more, from the standpoint of service, than the average priced hose.

The Master Car Builders' Association has adopted as standard a better air hose. The association was compelled to take this action because of the insistent demand of railroad managers. This hose, admittedly better, will cost over 60 cents a foot, an increase of 20 cents, or 50 per cent. over the present average price, and this amounts to an actual increase in air hose cost of \$730.00 per 1,000 cars. If the records previously mentioned fail to show any material advantage in buying 65 cent hose, and as

this expensive hose, of necessity, must be better than the cheapest, there is a gap in the investigations that can be explained only by one fact, that is, the railroads lose because they do not take proper care of the hose, and removal follows mechanical injury. In other words, air brake hose are made unfit for use before they have had an opportunity of rendering the service which they could give. It is hardly to be expected that a better hose will take care of this one most expensive item. If better hose are purchased and kept from all sorts of injury the railroads will receive greater service, not necessarily in the proportion rightfully looked for, but in an appreciable amount.

The best hose will have longer life, but when deterioration has set in, as it must, the hose will fail. With the better hose the failure is merely postponed so many months, but it is inevitable. If a certain brand of hose is known to be able to give so many months' service, it should be removed at the end of that time. The impracticability of car inspectors continually examining hose labels will at once be evident. One of the illustrations shows the dangerous position necessarily assumed by a man in order that he may read the present label showing the date of manufacture, and after he has read it he must calculate mentally whether or not the hose has reached the removal age.

One way to insure a hose being removed after a given time is to have figures vulcanized on the outside, and near the coupling end, to show the month and year in which a hose will have reached its allowable maximum age. The hose shown in the other illustration was made in August, 1913, and should not remain in



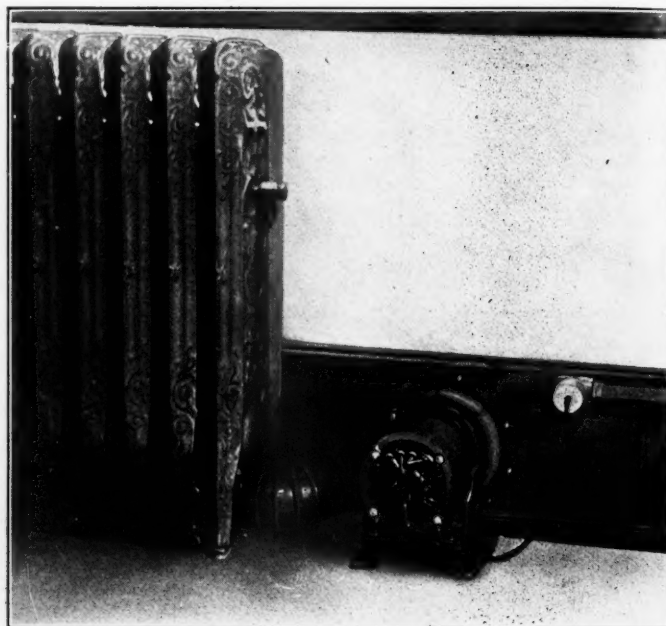
Hose So Labeled That the Removal Date May Be Read from Outside the Rails.

service after February, 1916, as shown by figures legible from outside the rails. A car inspector would remove this hose from service when the time had expired, and as he could easily tell this without any effort on his part, there would be no opportunity for the hose to remain on a car until so deteriorated that bursting under train line pressure would be inevitable.

Failure from mechanical injury may cut short the life before the hose has deteriorated to a sufficient extent to become dangerous. Only two things will minimize liability to accident with the better hose as now recommended: (1) Prevent failure from mechanical injury as much as possible; (2) Show on the hose, in legible figures, the date it should be removed on account of age.

## SMALL MOTOR-DRIVEN VENTILATING SETS FOR BUILDINGS.

When the Pennsylvania station at Pittsburgh was originally planned, it was equipped with what was at that time considered a thoroughly adequate ventilating system. The waiting rooms were furnished with fresh air by large motor-driven fans, and the offices were served by a system of ducts which communicated with the outside air, the natural draft being depended on for circulation. As the offices became more crowded, and especially as the officials began to realize the importance of an ample supply of fresh air in rendering employees comfortable and ef-



Arrangement of Motor Driven Ventilating Set at a Radiator.

ficient, it became evident that the natural draft was not sufficient and that some other arrangement must be made.

The problem was solved by installing in each office needing it, a small motor-driven ventilating set consisting of a Westinghouse motor and a Sirocco blower. As shown in the illustration, the set is placed on the floor near the radiator. It draws fresh air through the existing ducts and forces it out through the radiator, thus filling the room with fresh warm air. Current is obtained from the lighting circuit, and in some of the inside offices, the sets are used in summer as well as in winter. The set is not noisy, takes up very little room, and needs no attention beyond occasional lubrication. The sets are furnished in several different sizes to suit various conditions.

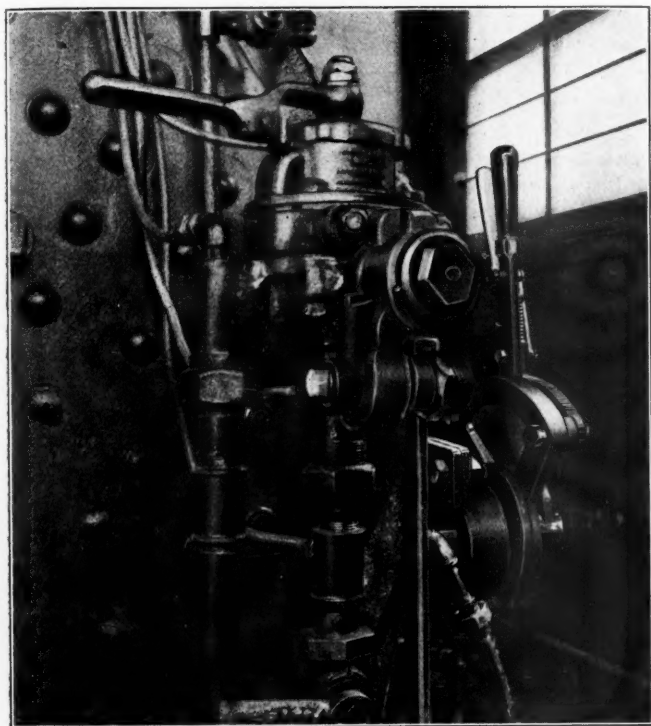
**TRANSPORTING COAL THROUGH PIPE LINES.**—A method of transporting coal by water pressure through a pipe has been suggested by E. G. Bell, engineer for the Hammersmith Electricity Works of London. By this method from 30 to 60 tons of coal per hour can, it is claimed, be forced through an 8-in. pipe leading from the Thames and under Chancellors' Road to the yard of the power plant on Fulham Palace Road, a distance of 600 yards.—*Coal Age*.

**BOILERS IN NEW ZEALAND.**—In New Zealand all steam boilers, other than on government railway locomotives, must be certified to be safe for work by the inspector of machinery department every year. In its annual report to parliament the department states that during the past year 7,011 boilers were examined, and that in 1,239 cases defects were discovered, of which 33 were very dangerous. The new boilers which were registered during the year numbered 587, with a total of 6,649 horse power.—*The Engineer*.

## NEW POWER REVERSE GEAR.

It is becoming generally recognized by railway men that locomotives in switching service, equipped with power reverse gear, can handle a much larger tonnage than those without, and as an adjunct to the efficiency and comfort of the crew such equipment cannot profitably be overlooked.

The Casey-Cavin reverse gear, which is a new power gear, has



Arrangement of Lever and Valve in the Cab.

recently been introduced by the Canadian Locomotive Company, Ltd., Kingston, Ont., and patents are pending in several countries. The illustrations show the general arrangement and also the controlling valve and lever in the cab. This application was

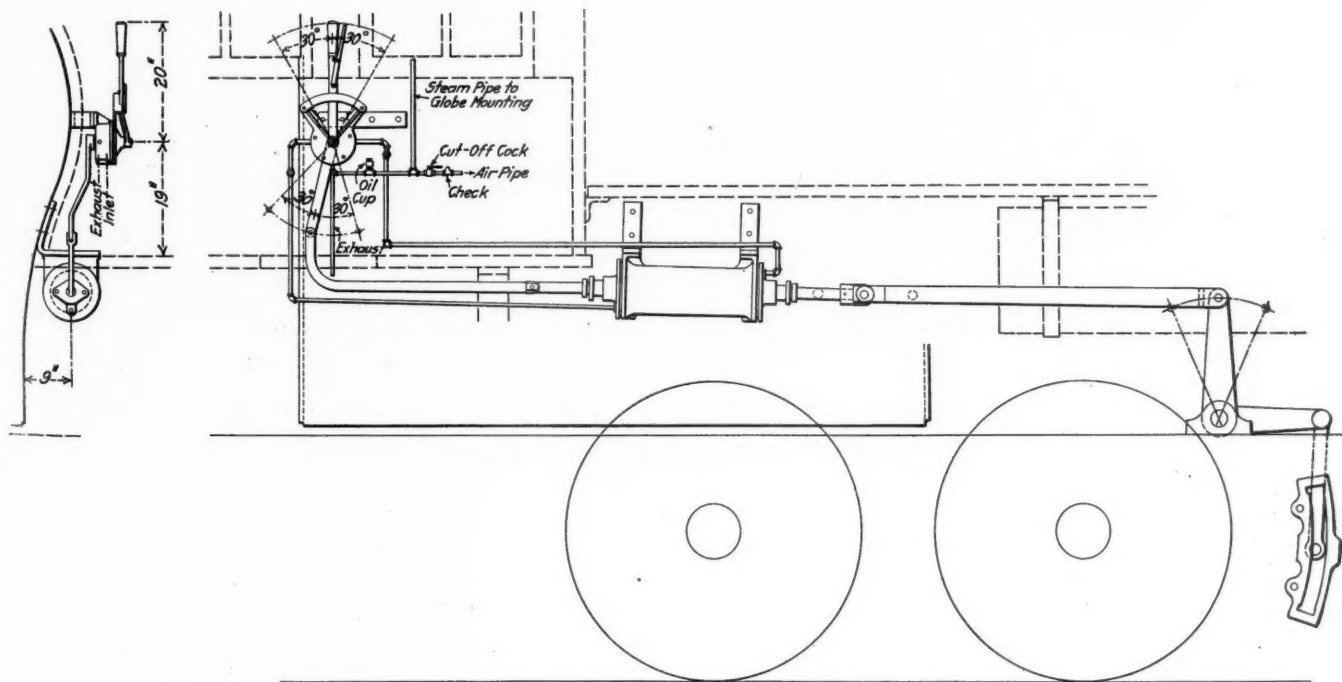
made to some 0-6-0 type switching locomotives for the Canadian Northern.

The device consists essentially of a cylinder containing a piston, and rods so arranged as to shift the links or radius bars, and a valve containing two independently movable discs, one operated by the hand lever and the other by the connecting bar from the piston. These valve discs are so ported and arranged that on a movement of the hand controlled disc, pressure is admitted to one end of the cylinder and exhausted from the other end, thereby producing a movement of the piston which brings the ports in the other disc to the same relation that they originally bore to the hand controlled disc. After either a complete reversal or only a "hooking-up" of the motion, the pressure is held on both sides of the piston, thereby locking it at any point. From this it will be seen that should any excessive strain be set up in the reach rod, causing a movement of the piston, a compensating admission of pressure would take place on the opposite side of the piston. The point of cut-off is indicated by the position of the lever on the quadrant, corresponding to the hand type of lever, thereby guarding against confusion to inexperienced enginemen.

The cylinder is compact and can readily be attached to the boiler, firebox or running board in a substantial manner without interfering with other parts of the locomotive. The space occupied in the cab is very small, the travel of the handle being about 16 in.; the maximum pull necessary is from 12 to 15 lbs. The device is preferably operated by air pressure, but provision is made for the use of steam in the event of trouble with the air system. The total weight of the gear for a simple locomotive is about 375 lbs., and for a Mallet about 500 lbs.

Reports from applications made thus far are extremely satisfactory and seem to indicate that the device fills a long felt want, as it is reliable and at the same time so simple that it adds little or nothing to the cost of maintenance. A gear designed on similar lines and equipped with a positive mechanical locking device has also been developed by this company for fast passenger locomotives.

RAILWAY ACTIVITY IN NEW SOUTH WALES.—In New South Wales the most important works have consisted of the double tracking of several of the main lines leading into Sydney and the construction of the North Coast Railway, which will connect several important coastal towns with Sidney.



Application of Casey-Cavin Power Reverse Gear to a Canadian Northern Switching Locomotive.

## General News.

The Pennsylvania Railroad has appointed 35 committees of employees whose duty it will be to study the smaller matters which might involve accidents.

B. R. Pollock, general manager of the Boston & Maine, has issued a circular calling the attention of officers and employees to the importance of "Safety First."

The prominent railroad companies of Pennsylvania have taken action to co-operate with the state forestry department in efforts to prevent and extinguish forest fires.

Intoxicating liquors cannot be sold in railroad cars in the state of Ohio after November 4, the attorney general having advised the state authorities that the constitution forbids the maintenance of "moving saloons."

The Chicago, Milwaukee & St. Paul "Olympian" train was derailed near Forsythe, Mont., on October 8, while running at a high speed. Several of the steel cars were thrown down the embankment, but were not crushed and no one was seriously injured.

The ninth annual reunion of the Veteran Employees' Association of the Philadelphia division of the Pennsylvania Railroad was held at Lancaster, Pa., September 20, with about 800 persons present. Among those in attendance were C. A. Jeffries, a retired locomotive engineer, 92 years old, and his son, C. A. Jeffries, a conductor, who also is retired on a pension.

The general manager of the Pennsylvania has issued instructions to superintendents directing them to make sure that no railroad equipment involved in an accident causing loss of life or injuries to passengers shall be destroyed until public officials have had ample opportunity to examine it. This order is accompanied by an explanation that it is not intended to interfere with the promptest possible resumption of traffic.

Local ticket agents of the Baltimore & Ohio have been invited by the company to join in a contest in essay writing, on the subject of "How Should a Ticket Agent Handle an Undecided Inquiring Caller?" A prize of twenty-five dollars will be awarded for the best essay. All ticket agents and ticket clerks may compete. The essays must not be longer than three hundred words, and they are to be submitted to Oscar G. Murray, chairman of the board of directors of the company, who will award the prizes.

The Pennsylvania has issued new baggage rules. Railroad baggage or packages must be checked the same as regular baggage; and sample trunks, once emptied, must be shipped by express to their destination; they cannot be checked. The new order as to railroad supplies carried in baggage cars is the result of failure to put off packages at their proper destination. Traveling men have been selling their samples at the end of their trips and checking the empty trunks home. This has been stopped.

The Baltimore & Ohio reports that on Tuesday, October 7, a special train occupied by a party of baseball writers enroute from Chicago to New York to report the world's series, were carried at a record breaking speed. The special train, left Pittsburgh at 1:45 A. M. with Pacific type engine 2137, and ran to Cumberland, Md., 147 miles in 3 hours and 37 minutes, without a stop. Engine 2168 made the run thence to Baltimore, 190 miles, without a stop in 3 hours 55 minutes, an average of 48.7 miles an hour. Both of these runs were made without taking water, there being no track tanks on this section of the line.

A study of the economic cost of the smoke nuisance in Pittsburgh was undertaken in connection with the smoke investigation in March, 1912. The work was begun by Dr. C. W. A. Veditz. The Mellon Institute of Industrial Research & School of Specific Industry has just issued smoke investigation bulletin No. 4, prepared by John J. O'Connor, Jr., and dealing with this subject. Estimates are made of the cost of the smoke nuisance to the various types of industry in the community as well as the loss due to imperfect combustion; and there is included an itemized bill showing the partial cost to the people of Pittsburgh. The total of this bill is \$9,944,740.

In the list of nominees for offices to be filled at the annual election on January 21, 1914, the nominating committee of the American Society of Civil Engineers recommends for president Hunter McDonald, chief engineer, Nashville, Chattanooga & St. Louis, Nashville; for vice-presidents, Charles F. Loweth, chief engineer, Chicago, Milwaukee & St. Paul, Chicago, and Gardner S. Williams, consulting engineer, Ann Arbor, Mich; for treasurer, John F. Wallace, president, Westinghouse, Church Kerr & Company, New York. Six directors are nominated as follows: Richard Montford, consulting engineer, Louisville & Nashville; Arthur S. Tuttle, deputy chief engineer, New York City; George W. Fuller, consulting engineer, New York City; Charles H. Keefer, Ottawa, Ont.; Mortimer E. Cooley, University of Michigan, Ann Arbor, and E. E. Haskell, Cornell University, Ithaca, N. Y.

The Long Island Railroad has dismissed four crossing watchmen for inattention to duty and has had them prosecuted under the penal code of New York, section 1984. This section provides that any employee in train service, switch tender, or having charge of stations, starting, regulating or running trains, etc., who is intoxicated while on duty, or any employee in train service, switch tender, officer, agent, or employee who wilfully violates or omits his duty by which human life or safety is endangered, is guilty of a misdemeanor. The four cases which were prosecuted were, crossing watchman found under the influence of liquor on duty, who pleaded guilty and received a suspended sentence; crossing watchman found under the influence of liquor, who pleaded guilty and received a sentence of 30 days; crossing watchman found asleep, sent to the county jail for 60 days; crossing watchman found asleep, sentenced to the New York state penitentiary for 90 days.

E. P. Gutlieus, general manager of the Intercolonial, has issued a circular which says in part: "Commencing on September 1, it is the intention to insist on a more rigid compliance with the rules and regulations which are made for the protection of the lives of the public and employees. All employees will start with a clean record beginning on this date and will receive credits for exceptional services. Where previously discipline was administered by suspensions, demerit marks will be placed against the record of the employee. For every repetition of an offense by an employee the demerit marks will be doubled. When demerit marks against employee number 60 his services will be dispensed with. For every 12 consecutive months of good service free from demerit marks an employee will have 20 demerit marks deducted from those that may stand against his record. Employees will be subject to summary dismissal for insubordination, drunkenness on or off duty, using intoxicating liquors when on duty, frequenting saloons or places of low repute, incompetency, dishonesty, and failing to carry out train rules respecting train movements."

### Arbitration Hearings Closed.

On October 10 the hearings on the demands of trainmen and conductors on the eastern roads for increases in pay were brought to a close, and on Wednesday of this week briefs were submitted by both sides following the summing up of Elisha Lee for the managers, and A. B. Garretson and W. G. Lee summing up for the employees.

### Ten Killed in an English Wreck.

On October 15 a local train into Liverpool, Eng., ran into the rear end of the Manchester express standing in the James street station, Liverpool, telescoping the rear coach and killing eight men and two women, and injuring a number of other passengers. The first accounts of the wreck say that the Manchester express stopped just outside of the station because of an engine failure and that apparently the engineman of the local ran past his signals.

### Unfilled Tonnage of the Steel Corporation.

The report of the United States Steel Corporation shows that the unfilled tonnage of the various subsidiary companies on September 30 amounted to 5,003,785 tons. This is a decrease of 219,683 tons as compared with the unfilled tonnage at the end of August. The unfilled orders on the books are now approximately

what they were on December 31, 1911, there having been a steady decline in unfilled tonnage since December 31, 1912, when the books showed 7,932,164 tons.

#### Details of Surprise Checking.

During the month of August the Pennsylvania Railroad made 185,000 efficiency tests and only 79 failures to observe the strict letter of the law were reported. In 1,852 cases tests were made of the observance of signals set at stop, and in all but one case there was perfect performance. Of 526 signals set at caution, all but three were duly obeyed. There were 1,321 tests of the observance by enginemen of flagmen's signals, and in not a single case was there failure to obey the rule perfectly. Flagmen were submitted to 5,989 tests, out of which there was perfect performance in all but 13 cases.

Conformity of enginemen to speed limit regulations was tested in 6,570 cases, with twenty-one failures. Observance of regulations as to handling explosives and inflammables was tested in 9,960 cases, with but two delinquents.

#### Grand Trunk Pacific.

Track laying on the main line of the Grand Trunk Pacific towards Prince Rupert has been completed to mile 1,200 west of Winnipeg, Man.. At mile 1,190, where the railway for the second time crosses the Fraser river, track laying was held up for a short time until the steel bridge across the Fraser river was completed. The Fraser river is crossed for the third time about 40 miles west of the second crossing. Track laying will not be delayed at this crossing, as a temporary trestle is being erected, pending the completion of a steel bridge.

In the province of Saskatchewan 105 miles of branch line has just been opened for traffic on a part of the Biggar-Calgary branch. This line has been completed to Loverna, on the boundary line between Saskatchewan and Alberta, 105 miles from Biggar. Track laying on the Regina-Moose Jaw & North Westerly branch has just been completed to mile 91, a short distance beyond Mawer, Sask., 50 miles west of Moose Jaw, and within a few miles of the Saskatchewan river. Permission has been granted by the board of railway commissioners for the operation of this line, and as this is one of the greatest grain producing lines in the West, a very heavy traffic will move this season. On the Tofield-Calgary branch ballasting has been completed into Calgary, and first-class passenger service can be established as soon as terminals at Calgary are completed.

#### Dangers of the Railroad; A Different View.

Railroad travel in the United States is reasonably safe. A New York mathematician presents the safety proposition in a way that is unique and ought to be somewhat reassuring to timorous travelers:

"A typical journey for all roads in the country is now 34 miles, and there are taken on the average 2,275,122 such journeys in safety to each journey which results fatally. If a man were to ride out these 2,275,122 safe journeys at two per day for each business day in the year, it would take him 3,792 years. To have begun in time to meet his death in 1914 he would have had to start commuting in the year 1778 B C., when Egypt was under the shepherd kings, and 458 years before Moses led the children of Israel through the Red Sea."

Railway mortality nowadays is mostly confined to railway employees and to persons not passengers. Many railway employees are careless and assume needless risks in the discharge of their duties. Thousands of trespassers on railroad tracks are killed every year, and in very few instances can this be charged to any fault in railroad management or operation.—*Louisville Courier-Journal*.

#### Department of Development.

A department of development has been created by the Ann Arbor and the Manistique & Lake Superior railroads with G. A. Weller, with office at Toledo, in charge. The object is to secure the greatest possible development of the territory served by the Ann Arbor and the Manistique & Lake Superior. Some of the things which will be undertaken are:

Development of new farm lands and increasing the productivity of existing farms in every possible way.

Encouraging emigration into this territory to purchase and work all farm lands with view of securing their maximum productiveness.

Assistance in securing skilled instructors, material, etc., for agricultural and fruit-growing educational purposes.

Securing location of new factories and industries for this territory.

All possible assistance in increasing the productivity and efficiency of existing factories and industries.

Assistance in securing co-operation of the state and federal authorities in the upbuilding of agricultural conditions, fruit culture, etc., in every possible way.

There is a large acreage of undeveloped land tributary to the lines of these companies which can be largely developed in agriculture and fruit-growing districts if it is properly handled.

#### New York Subways.

The New York Public Service Commission, First district, is asking for bids, to be opened November 10, for the construction of Section No. 3 of the Seventh avenue subway in the borough of Manhattan. The Seventh avenue subway is to be operated by the Interborough Rapid Transit Company, and Section No. 3 covers that portion of the route in Varick street and Seventh avenue extension between Beach street and Commerce street.

During the past week the commission has executed the contract awarded a short time ago to the Snare & Triest Company for the construction of section No. 1 of the elevated railroad in Queens. This contract embraces the junction station at the Queensboro bridge plaza, where the Astoria and Corona lines separate. The contract price for this section is \$880,000.

A public hearing was held recently by the commission on the two tunnel routes for the Brooklyn connections of the Interborough and New York Municipal systems in Manhattan. The commission has also ordered a public hearing for October 24 on the contract for the Livonia avenue extension of the Eastern Parkway subway, and for October 31 on the form of contract for the first section of the Eastern Parkway line. The Eastern Parkway route is to be operated by the Interborough Rapid Transit Company.

The reports of the engineers of the New York Public Service Commission for the First district, shows that there is now under contract \$83,000,000 worth of work on the new subway lines of the dual system of rapid transit, and an average daily force of 7,000 men are at work. Of this \$83,000,000, about \$38,000,000 is on lines to be operated by the Interborough Rapid Transit Company, and \$45,000,000 on the lines to be operated by the New York Municipal Railway Corporation. Of the latter, however, the Fourth avenue subway in the borough of Brooklyn, and the Centre street loop subway in the borough of Manhattan, costing together about \$28,000,000, are practically completed. It is estimated that the construction work on the city-owned lines will cost about \$200,000,000. There is, therefore about two-fifths of the value of this work already under contract. Of the remainder, to cost \$117,000,000, it is expected that more than one-half will be under contract before the end of the year, so that by that time, nine months after the signing of the dual system operating contracts, actual construction work will be in progress on three-quarters of the city-owned lines.

#### The Federal Valuation Board.

Charles A. Prouty is to retire as a member of the Interstate Commerce Commission to become director of physical valuation. The Interstate Commerce Commission announces that for the purpose of valuing railway property it has divided the country into five districts. Each to embrace approximately 50,000 miles of railroad. The title of each district, the headquarters city and the states included in each are as follows:

Eastern—Washington, D. C.; Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia.

Southern—Chattanooga, Tenn.; Alabama, Florida, Georgia,

Indiana, Kentucky, Mississippi, Ohio, Panama, Porto Rico, South Carolina and Tennessee.

Central—Chicago, Arkansas, Illinois, Iowa, Louisiana, Michigan, Minnesota and Wisconsin.

Western—Kansas City; Colorado, Indian Territory, Kansas, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota and Texas.

Pacific—San Francisco; Alaska, Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

Each valuation district will be under the direction of one of the members of the Valuation Board and will be in direct charge of one of the district engineers recently appointed. The Washington office will be in charge of Mr. Wendt; local engineer, Mr. Shea; Chattanooga, in charge of Mr. Jones, local engineer, Mr. Bayliss; Chicago, in charge of Mr. Pence, local engineer, Mr. Moore; Kansas City, Mr. Worley, local engineer, Mr. Witt; San Francisco, Mr. Thompson, local engineer, Mr. Pitman.

#### Revised Specifications for Valuation Maps.

The Interstate Commerce Commission has issued a second tentative draft of specifications for maps and profiles for use in connection with the valuation of railways. These specifications are modified in several important respects from the original draft issued August 1, as a result of the objections made by the committee of 15 engineers representing the railways, reviewed in the *Railway Age Gazette* of October 3, page 608.

The most important modification in the second draft is that permitting certain departures from the specifications regarding maps and profiles already made which comply in general with the rules laid down. No modification of the standards will be permitted on maps and profiles of extensions, improvements or changes; of existing railways where no such records now exist or where the present records are so incomplete as to require, in the judgment of the commission, new maps and profiles. The commission does not state at this time the extent to which present maps and profiles may be acceptable, as this can only be determined in the case of each individual carrier by an examination of its records. The commission, however, assures the railways of its purpose to demand only that amount of work to perfect existing maps and profiles as in its judgment is necessary to make them acceptable, but still insists that all maps and profiles for the permanent files of the commission shall be on standard size sheets and on cloth. To enable the commission to begin the valuation work promptly the railways are requested to furnish copies of existing maps and profiles and other standard and special plans.

With reference to showing the property lines and names of adjacent line owners, the original specifications are modified to require the railways to show the section and quarter section lines for a distance of one mile on each side of the railway only where such information is now in the possession of the railways.

These various modifications will decrease to a considerable extent, the work required of the railways, especially in the western states where the federal valuation work will be largely a duplication of that already done for various state commissions and these modifications should not in any way depreciate the value or the accuracy of the federal valuations.

#### A False Political Issue.

"We will (sic) be content only when we get the Grand Trunk line through from Canada to Boston," remarked Gov. Foss at the waterways dinner [in his campaign for another term as governor of Massachusetts]. It is questionable if Gov. Foss or any one else will be content even then. Still another railroad will have been added to the burden of those already existing, on which the public will be asked to enable dividends for the owners. The single-track highways to Canada will have been made two instead of one—and neither will be able to lay a double track because neither can afford the outlay. Eventually the exigencies of a ruinous competition will lead to a merger, and then Gov. Foss and those like him "will not be content" until they have gone through the same old course of things with

the Canadian Pacific! The marvel to us is how any person of full age, observing what has invariably happened in the case of previous railroad parallels, can advocate the building of still more parallels as a cure for the failure of previous ones. Nothing more supremely childish could well be conceived as an economic proposition. If only we could stop this everlasting notion that sometime a parallel railroad is going to insure competition and yet at the same time insure adequate service, even though such service cannot even pay its own keep, we might begin to do a little something sensible about forcing the railroads to serve the public as it ought to be served. The Grand Trunk, if built, would simply perpetuate the present grossly inadequate service, by making it even more nearly impossible, economically speaking to improve it than it is now.

Understand this: If you really want to improve a railroad service, the very last way to do it is to impoverish it by further subdividing an overworked field. The only sensible way is to do it by direct action. Stop looking at a railroad as if it were as private an enterprise as a woolen mill, and deal with it more as if it belonged to the public and were subject to public regulation. You might multiply Grand Trunks and C. P. R.'s until the cows come home, and in every successive case you would do nothing whatever but pile more and more railroad iron on the long-suffering camel's back to be carried at great cost by the very burden-bearer you most want to relieve.—*Lowell (Mass.) Courier.*

#### American Society of Civil Engineers.

At the informal meeting of the American Society of Civil Engineers, held on October 15, George A. Harwood, M. Am. Soc. C. E., chief engineer electric zone improvements, New York Central & Hudson River, gave an illustrated lecture on the Grand Central Terminal Work.

#### Roadmasters and Maintenance of Way Association.

The annual meeting of the executive committee of the Roadmasters and Maintenance of Way Association will be held at the Auditorium hotel, Chicago, at 11 a. m. on Saturday, October 25.

#### MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

- AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May, 1914.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.
- AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York. Annual meeting, October 14-15, Philadelphia, Pa.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Next convention, April 21, Houston, Tex.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Thursday and Friday in May.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York. Next convention, October 13-17, Atlantic City, N. J.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—H. G. McConaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.
- AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, November 19, 1913, Chicago.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-24, 1913, Montreal.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 17-20, Chicago.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.
- AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—C. W. Egan, B. & O., Baltimore, Md. Next convention, May, 1914, St. Paul, Minn.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Annual convention, October 18-24, Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago. Next convention, May 20-23, New Orleans, La.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, December 9-10, Galveston, Tex.
- ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y.

## Traffic News.

The Illinois Central and the Yazoo & Mississippi Valley, in co-operation with the Mississippi State Agricultural College, is preparing to run a "live stock and silo" special educational train.

The annual meeting of the National Industrial Traffic League will be held at the Hotel La Salle, Chicago, on November 13 and 14. The annual dinner will be held on the evening of November 13.

The Southern Pacific has announced that the usual one-way colonist rates to the Pacific coast will be effective next spring from March 15 to April 15, inclusive. Rates will be the same as those in effect for the fall colonist season, but the period will be 30 days instead of 15.

It is reported that the railways of Louisiana are considering the advisability of appealing to the courts to prevent the enforcement of an order issued by the Louisiana Railroad Commission requiring them to give passenger trains preference over freight trains.

The Central Passenger Association at its meeting in Chicago last week appointed a committee to report on the advisability of either abolishing special clergy fares, or establishing a uniform practice in regard to the granting of such rates. A committee was also appointed to consider the question of extension of tourist car facilities in the territory east of Chicago.

On October 15 a new fast freight line, to be known as the Baltimore Western Dispatch, was established for handling both baggage and carload freight between Baltimore and Cincinnati, Chicago, Louisville, St. Louis and points west and southwest; the Southern Railway, Chesapeake Steamship Company and the Chesapeake & Ohio having co-operated to form this new fast freight line.

The annual report of the Wells-Fargo Express Company presented at the annual meeting last week showed gross receipts from operation during the last fiscal year of \$34,934,814, as compared with \$32,465,970 for the preceding year. The length of the routes operated increased considerably; railroad 65,784 miles, increased 1,443; other routes 31,062 miles, increase 17,419 miles.

Various proposals have been brought before the Ontario government by county counsels looking to an increase in the taxes paid by railroad corporations in Ontario. In Ontario railroad taxes are on the basis of the value of land used by them in municipalities without any added increment for improvements or equipment, and in addition they pay to the province \$60 a mile for single track and \$40 a mile for each additional track, the maximum being \$100 a mile. This is claimed to be only about one-third of the rate that other tax payers are paying on land similarly situated.

### Canadian Ticket Agents' Association.

The convention of this association was held at Cleveland, Ohio, October 8, 9 and 10, with a large attendance. The members were entertained by a committee of Cleveland Passenger Agents. One of the principal subjects discussed was advertising, and J. Kidd, of Goderich, Ont., said that he distributed out-of-date folders among school children, thus stimulating the study of geography, and at the same time keeping the name of his road prominent. The president of the association for the ensuing year is George J. Alexander, Richmond, P. Q.; secretary, E. de la Hooke, London, Ont.

### The North Carolina Rate Situation.

The North Carolina house of representatives has accepted the railroads' offer of compromise on the proposed rate reduction regulation and the state senate is now considering the matter. The governor, in commenting on this matter in his message to the special session of the general assembly said: "In the original proposition there were conditions that made acceptance impossible. These have been eliminated and the proposition has

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after second Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, May 20-22, Galveston, Tex.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago. Annual convention, May 18-22, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July, Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Next convention, third Tuesday in August.

MAINTENANCE OF WAY & MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa. Next convention, November 18-20, Louisville, Ky.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago.

MASTER CAR & LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass.

NATIONAL RAILWAY APPLIANCE ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3rd Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. M. St. P., Duluth, Minn.; 4th Saturday, Duluth.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York. Annual dinner, second week in December, 1913, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Mobile & Ohio, Mobile, Ala. Next meeting, October 7, Chicago.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo. Next meeting, November 11-12, Baltimore, Md.

RAILWAY SIGNAL ASSOCIATION.—C. E. Rosenberg, Bethlehem, Pa. Convention, October 14, Nashville, Tenn.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

RAILWAY TEL. & TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala. Annual meeting, October 16, 1913, Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 16, Jacksonville, Fla.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meeting, Chicago.

UTAH SOCIETY OF ENGINEERS.—Fred D. Ulmer, Oregon Short Line, Salt Lake City, Utah; 3rd Friday of each month, except July and August.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

been amended to the decided advantage of the state. As it now stands, I believe that it makes a reduction reasonable under the present rate system. I know that it makes a substantial reduction. . . . The saving in freight rates will be a substantial gain, but the greater consideration is the opportunity for business that lower rates would offer. . . . The proposed reductions are, in my opinion, as much as or more than we could secure under the present system and construction of the law through the Interstate Commerce Commission even by long and expensive litigation. Under this proposition we would secure the benefits of the reduction with little expense and as soon as the rates could be put into effect."

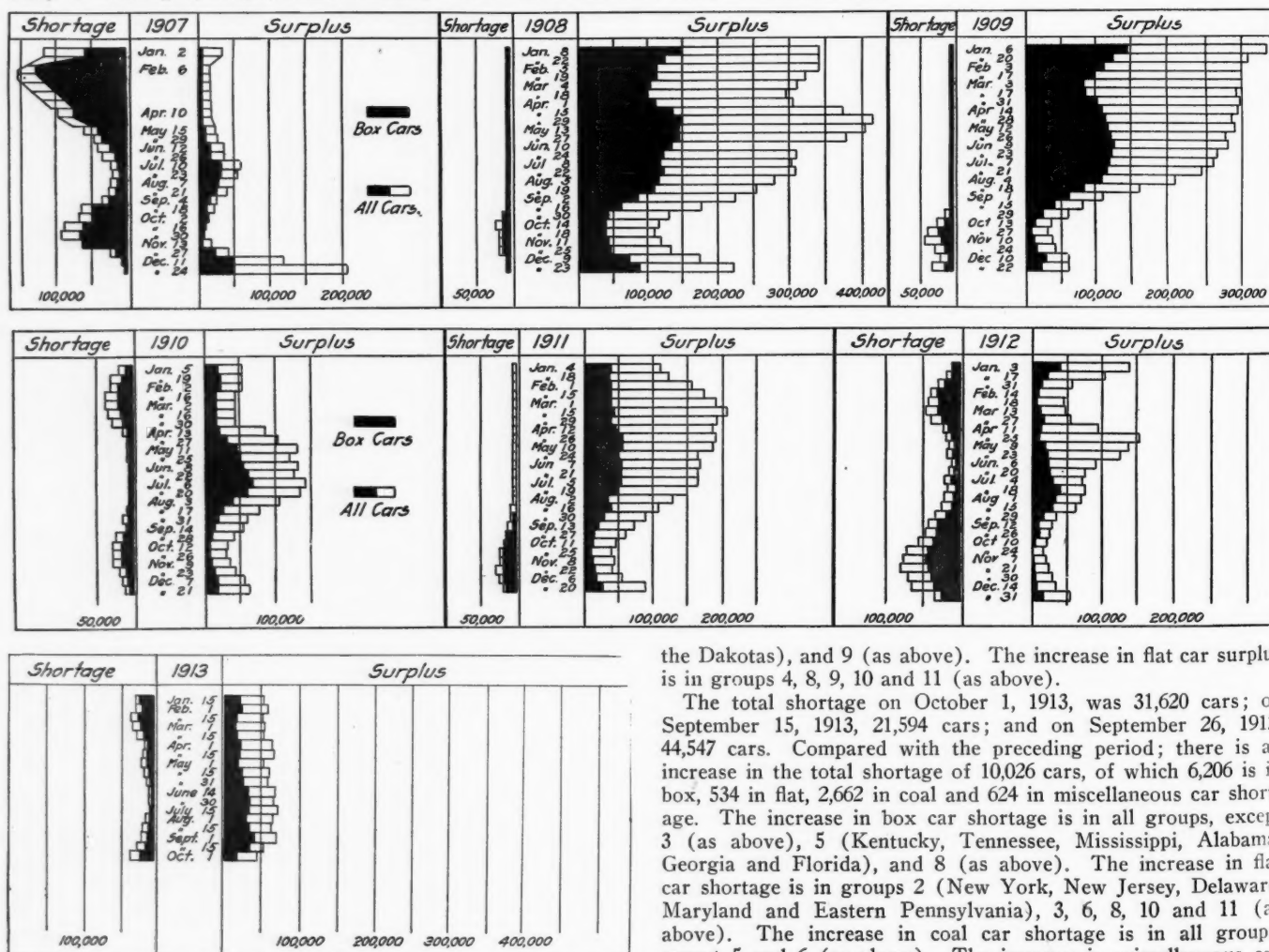
#### Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railroads, of the American Railway Association, in presenting

statistical bulletin No. 153, giving a summary of car surpluses and shortages by groups, from June 20, 1912, to October 1, 1913, says: The total surplus on October 1, 1913, was 41,994 cars; on September 15, 1913, 61,753 cars; and on September 26, 1912, 26,754 cars. Compared with the preceding period; there is a decrease in the total surplus of 19,759 cars, of which 16,311 is in box, 761 in coal, 3,116 in miscellaneous, and an increase of 429 in flat car surplus. The decrease in box car surplus is in groups 1 (New England Lines), 6 (Iowa, Illinois, Wisconsin and Minnesota), 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas), 10 (Washington, Oregon, Idaho, California, Nevada and Arizona), and 11 (Canadian Lines). The decrease in coal car surplus is in all groups, except 4 (the Virginias and Carolinas), 9 (Texas, Louisiana and New Mexico), and 10 (as above). The decrease in miscellaneous car surplus is in all groups, except 3 (Ohio, Indiana, Michigan and Western Pennsylvania), 4 (as above), 7 (Montana, Wyoming, Nebraska and

Date	No. of roads.	CAR SURPLUSES AND SHORTAGES.									
		Surpluses					Shortages				
		Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—October 1, 1913.....	7	0	0	0	127	127	1,283	113	100	35	1,531
" 2.—" 1, 1913.....	33	389	49	748	232	1,418	1,500	1	950	36	2,487
" 3.—" 1, 1913.....	29	340	29	300	751	1,420	1,982	180	2,103	381	4,466
" 4.—" 1, 1913.....	14	3,462	398	859	554	5,273	3,840	361	4,573	580	9,354
" 5.—" 1, 1913.....	24	0	0	265	201	466	1,214	164	628	115	2,121
" 6.—" 1, 1913.....	33	2,120	197	1,064	2,697	6,078	2,368	247	857	147	3,619
" 7.—" 1, 1913.....	3	61	18	544	430	1,053	163	0	0	32	195
" 8.—" 1, 1913.....	19	3,080	426	1,451	2,260	7,217	221	8	216	177	622
" 9.—" 1, 1913.....	15	3,202	819	476	685	5,182	107	0	4	25	136
" 10.—" 1, 1913.....	21	2,729	917	2,226	6,313	12,185	1,010	288	70	298	1,666
" 11.—" 1, 1913.....	6	704	311	20	540	1,575	3,590	595	892	166	5,243
Total .....	204	16,087	3,164	7,953	14,790	41,994	17,278	1,957	10,393	1,992	31,620

\*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin and Minnesota lines; Group 7—Montana, Wyoming, Nebraska, North Dakota and South Dakota lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Washington, Oregon, Idaho, California, Nevada and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages, 1907 to 1913.

the Dakotas), and 9 (as above). The increase in flat car surplus is in groups 4, 8, 9, 10 and 11 (as above).

The total shortage on October 1, 1913, was 31,620 cars; on September 15, 1913, 21,594 cars; and on September 26, 1912, 44,547 cars. Compared with the preceding period; there is an increase in the total shortage of 10,026 cars, of which 6,206 is in box, 534 in flat, 2,662 in coal and 624 in miscellaneous car shortage. The increase in box car shortage is in all groups, except 3 (as above), 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida), and 8 (as above). The increase in flat car shortage is in groups 2 (New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania), 3, 6, 8, 10 and 11 (as above). The increase in coal car shortage is in all groups, except 5 and 6 (as above). The increase in miscellaneous car shortage is in all groups, except 7 (as above).

Compared with the corresponding period of 1912; there is an increase in the total surplus of 15,240 cars, of which 7,736 is in box, 1,800 in flat, 1,759 in coal and 3,945 in miscellaneous car surplus. There is a decrease in the total shortage of 12,927 cars, of which 10,016 is in box, 1,612 in flat, 1,318 in coal, and an increase of 19 in miscellaneous car shortage.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report and the diagram shows total bi-weekly surpluses and shortage from 1907 to 1913.

#### General Crop Conditions.

The Department of Agriculture estimates crop conditions to be as follows:

FOR THE UNITED STATES.						
Crops.	Condition Oct. 1, or at time of harvest.			Acreage, 1913.		
	1913.	1912.	10-yr. av. 1913.	1913.	P. ct. of 1912.	Acres.
Corn .....	55.3	82.2	80.6	65.1	99.8	106,884,000
Buckwheat .....	65.9	89.2	84.2	75.4	100.0	841,000
Potatoes .....	67.7	85.1	76.4	69.9	99.3	3,685,000
Tobacco .....	76.6	81.8	83.1	74.5	93.4	1,144,500
Flax .....	74.7	83.8	78.5	74.9	85.1	2,425,000
Rice .....	80.3	89.2	87.5	88.0	114.0	824,100
Apples .....	46.6	67.8	54.1	47.7	....	....

The yields indicated by the condition of crops on October 1, 1913, or at time of harvest, and the final yields in preceding years, for comparison, follow:

Crops.	Yield per acre.			Total production in millions of bushels.			Increase (+) or decrease (-) in prospects during September.
	1913a.	1912.	1908-12 ave.	1913a.	1912.	1911.	
Corn .....	22.2	29.2	26.5	2,373	3,125	2,531	+0.9
Buckwheat .....	16.5	22.9	21.0	14	19	18	-6.7
White potatoes..	86.7	113.4	96.1	319	421	293	-1.8
Tobacco, lbs....	766.0	785.5	822.3	877	963	905	+1.9
Flax .....	8.7	9.8	8.2	21	28	19	+5.0
Rice .....	30.9	34.7	33.7	25	25	23	-7.4

a Interpreted from condition reports.

Preliminary estimates of production have been made as follows:

Crops.	Yield per acre.			Production (000 omitted).		
	1913.	1912.	1908-12 ave.	1913.	1912.	1911.
Spring wheat ....	13.0	17.2	13.3	242,714	330,348	190,682
Winter wheat ....	16.5	15.1	15.2	510,519	399,919	430,656
All wheat .....	15.2	15.9	14.6	753,233	730,267	621,338
Oats .....	29.3	37.4	29.7	1,122,139	1,418,337	922,298
Barley .....	23.9	29.7	24.5	173,301	223,824	160,240
Rye .....	16.3	16.8	16.2	34,789	35,664	33,119
Hay, tame .....	1.31	1.47	1.38	63,460	72,691	54,916

The quality of spring wheat is 92.0 per cent., as compared with a ten-year average of 86.9; oats, 89.1 per cent., compared with a ten-year average of 87.1; barley, 86.4 per cent., compared with a ten-year average of 87.0.

Details for important states follow:

OATS.							
Production.							
States.	Per acre.		Total (000 omitted).		Quality.		
	1913. Bus.	1912. Bus.	1913. Bus.	1912. Bus.	1913. P. ct.	1912. P. ct.	
Iowa .....	34.5	44.2	168,326	217,818	94	95	
Illinois .....	23.8	43.3	102,435	182,726	78	91	
Minnesota .....	37.8	41.7	112,531	122,932	93	94	
Wisconsin .....	36.5	37.3	83,768	84,746	95	87	
Nebraska .....	26.5	24.4	60,288	55,510	89	89	
North Dakota .....	25.7	41.4	57,928	95,220	89	95	
Kansas .....	19.5	32.0	36,894	55,040	80	91	
Ohio .....	30.2	44.0	55,055	93,280	89	90	
Indiana .....	21.4	40.1	37,471	79,799	77	90	
South Dakota .....	26.5	33.8	42,294	52,390	88	91	
Michigan .....	30.0	34.9	45,450	51,826	91	82	
New York .....	33.5	30.8	43,114	36,714	94	83	
Missouri .....	21.2	33.0	26,246	37,125	78	94	
Pennsylvania .....	31.0	33.1	35,774	36,377	90	88	
United States .....	29.3	37.4	1,122,139	1,418,337	89.1	91.0	

SPRING WHEAT.							
Production.							
States.	Per acre.		Total (000 omitted).		Quality.		
	1913. Bus.	1912. Bus.	1913. Bus.	1912. Bus.	1913. P. ct.	1912. P. ct.	
North Dakota .....	10.5	18.0	79,695	143,820	93	89	
Minnesota .....	16.2	15.5	67,959	67,038	92	86	
South Dakota .....	9.0	14.2	33,075	52,185	91	88	
Washington .....	19.0	20.4	23,161	26,459	90	91	
United States .....	13.0	17.2	242,714	330,348	92.0	88.7	

CORN.					
States	Per cent. of U. S. acreage in States.	Condition October 1.			Condition Sept. 1,
		1913.	1912.	10-yr. av.	1913.
Illinois .....	9.9	61	86	84	62
Iowa .....	9.3	77	91	82	76
Nebraska .....	7.1	39	77	78	37
Kansas .....	6.9	10	72	69	10
Missouri .....	6.9	44	84	80	41
Texas .....	6.6	78	75	73	78
Oklahoma .....	4.8	38	63	67	39
Indiana .....	4.6	80	89	85	81
Georgia .....	3.8	87	74	86	87
Ohio .....	3.7	80	90	84	81
Kentucky .....	3.4	60	89	86	59
Tennessee .....	3.1	66	82	85	65
Alabama .....	3.0	78	80	86	78
Mississippi .....	3.0	81	80	86	81
North Carolina .....	2.6	85	75	84	87
South Dakota .....	2.5	79	84	84	78
Arkansas .....	2.3	70	78	80	71
Minnesota .....	2.2	99	84	83	95
South Carolina .....	1.9	85	75	82	86
Virginia .....	1.9	85	73	85	85
Louisiana .....	1.8	84	80	82	85
Michigan .....	1.5	80	82	82	80
Wisconsin .....	1.5	94	83	84	94
Pennsylvania .....	1.4	78	85	84	81
United States .....	100.0	65.3	82.2	80.6	65.1

#### INTERSTATE COMMERCE COMMISSION.

For item regarding the Valuation Board see General News section.

The commission has suspended from October 21 until April 21 supplement to the tariff of the Alabama Great Southern that would advance the rates for the transportation of lumber and shingles, C. L., from local points on the Alabama Great Southern in Alabama and Georgia to Chattanooga, Tenn.

The commission has suspended from October 11 until February 8 certain schedules contained in the tariff of the Louisville & Nashville, which proposed to reduce by from 5 to 25 cents per ton, rates on coal, from mines on the Louisville & Nashville in Virginia located west of Middleborough, Va., to points north of the Ohio river. The Black Mountain Coal Company et al., operating mines located east of Middleborough in the St. Charles district, claim that the proposed reduction is a discrimination against their mines, in that a similar readjustment is not made in rates from mines east of Middleborough. The present rates from mines in the St. Charles district are the same as rates from mines in the Middleborough-Jellico district.

#### STATE COMMISSIONS.

The State Corporation Commission of New Mexico recently held an informal conference with the traffic and operating officials of the various express companies operating in the state, for the purpose of considering a general reduction of express rates. As a result of this conference the commission announces that local express rates will be reduced voluntarily by the companies by amounts ranging from 25 to 60 per cent., the reductions to become effective within 60 to 90 days. The reductions will, in general, correspond with the reductions recently ordered by the Interstate Commerce Commission in interstate rates.

#### COURT NEWS.

Judge Farrington, of the United States district court at Carson City, Nev., has rendered a decision enjoining the Nevada State Railroad Commission from putting into effect an order issued last January reducing main and branch line passenger fares in the state from five and four cents to three cents per mile.

Fines of \$1,000 each have been assessed by the federal district court at Pueblo, Col., against the Denver & Rio Grande and Colorado & Southern railways, and the Victor American Fuel Company, Colorado Fuel & Iron Company, United States Portland Cement Company, Colorado Portland Cement Company and Great Western Sugar Company, for giving and receiving passes for travel in the state. The fines were assessed under indictments returned over a year ago on the ground that the giving of state passes to interstate shippers was a violation of the Elkins act. The companies filed pleas submitting to the judgment of the court.

## REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JULY, 1913.

Name of road.	Average mileage operated during period.	Operating revenues				Operating expenses				Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total.	Maintenance of way and structures.	Traffic.	Trans- portation.	General.	Total.					
Bingham & Garfield .....	26	\$129,889	\$4,391	\$134,280	\$9,053	\$11,168	\$22,322	\$3,031	\$53,897	\$81,164	.....	\$2,801	\$78,363	\$5,312
Chicago, Terre Haute & Southeastern .....	362	126,617	19,250	145,867	31,526	2,974	46,445	6,570	118,717	31,119	.....	11,500	111,516	11,677
Delaware & Hudson Co.—R. R. Dept. ....	854	1,654,703	361,815	2,016,518	157,994	31,122	694,403	68,602	1,267,953	807,525	—3,209	49,700	754,616	—46,532
Detroit & Mackinac .....	411	68,491	36,127	104,618	12,277	2,789	40,150	2,473	74,143	37,160	1,214	8,403	29,971	3,821
Detroit & Toledo Shore Line .....	79	114,586	.....	114,586	12,652	1,179	32,433	3,018	56,215	58,485	.....	5,900	52,585	14,247
Duluth & Iron Range .....	272	1,124,207	25,892	1,150,099	107,275	68,803	221,334	12,606	411,727	751,296	6,097	64,126	693,267	12,589
Mobile & Ohio .....	1,122	868,345	127,413	995,758	121,780	198,014	37,676	31,862	790,361	266,658	—1,149	30,672	234,837	27,036
Nevada Northern .....	165	121,737	15,156	136,893	18,895	319	31,047	4,493	68,727	71,657	.....	6,651	64,976	—14,786
New Orleans, Mobile & Chicago .....	404	140,177	34,159	174,336	28,884	3,997	66,236	7,739	119,567	66,236	.....	5,675	60,401	13,800
Southern in Mississippi .....	281	41,320	28,272	69,592	25,519	1,117	44,035	3,939	86,901	—9,620	.....	6,812	—16,432	—362

MONTH OF AUGUST, 1913.

Alabama Great Southern .....	309	\$281,150	\$133,259	\$414,409	\$49,805	\$114,504	\$12,898	\$9,380	\$31,518	\$116,655	—\$530	\$15,700	\$100,425	—\$15,258
Ann Arbor .....	292	118,900	44,601	163,501	25,347	4,915	63,697	6,194	124,243	75,096	198	13,930	61,364	252
Atlanta & West Point .....	23	44,734	44,601	89,335	15,031	5,201	31,047	4,493	70,930	21,757	211	6,485	15,463	5,269
Baltimore & Ohio—System .....	4,456	7,174,562	1,779,754	8,954,316	1,264,408	1,437,300	194,033	185,940	6,394,377	3,048,777	—74,751	258,860	2,715,166	123,114
Baltimore & Ohio Terminal .....	77	.....	953	953	19,976	764	69,111	5,015	113,800	38,484	1,067	16,052	23,499	9,817
Bingham & Garfield .....	26	129,022	4,569	133,591	19,313	864	23,491	1,516	52,685	81,551	.....	2,822	78,729	—1,976
Birmingham Southern .....	43	68,152	1,131	69,283	15,068	529	37,618	4,440	70,611	41,221	.....	1,805	39,416	5,785
Central of New Jersey .....	676	1,734,538	674,267	2,408,805	258,800	39,075	721,494	42,565	1,410,316	1,083,591	92,697	111,222	1,065,066	—232,664
Central Vermont .....	536	228,642	136,386	365,028	86,224	58,861	172,193	6,563	331,709	59,892	746	15,500	45,138	40,249
Chicago & Alton .....	1,032	917,107	455,029	1,372,136	178,695	267,672	481,683	33,594	1,001,451	471,918	—2,110	39,000	403,808	55,894
Chicago & Northwestern .....	8,000	4,894,141	2,228,702	7,122,843	1,376,571	1,058,975	2,680,011	142,074	5,383,916	2,393,976	5,954	320,000	2,079,930	35,408
Chicago Great Western .....	1,496	864,145	130,737	994,882	181,480	16,671	433,767	34,656	875,839	431,706	986	38,650	371,042	44,405
Chicago, Indianapolis & Louisville .....	1,617	422,954	178,128	601,082	95,130	94,744	220,011	16,989	443,836	206,901	.....	24,372	182,529	12,701
Cincinnati, Hamilton & Dayton .....	1,015	666,230	195,595	861,825	138,001	152,058	426,942	21,876	760,850	208,582	.....	34,712	173,870	—118,194
Cincinnati, New Orleans & Texas Pacific .....	337	630,808	176,187	806,995	83,427	215,461	238,347	19,398	583,674	263,628	—1,237	29,000	233,391	—28,265
Cincinnati Northern .....	245	99,858	32,520	132,378	29,233	2,371	56,281	3,250	129,671	8,740	.....	5,500	3,240	—28,522
Cleveland, Cincinnati, Chic. & St. Louis .....	2,014	2,059,936	943,339	3,003,275	523,444	74,475	1,238,071	56,173	2,687,548	571,584	.....	103,800	468,748	—602,499
Cumberland Valley .....	162	202,584	81,091	283,675	68,630	5,482	98,431	7,912	209,761	87,534	68	5,702	81,900	—29,822
Delaware & Hudson Co.—R. R. Dept. ....	854	1,738,946	491,725	2,230,671	170,833	275,048	26,439	709,506	1,047,850	1,047,850	—1,142	49,700	997,008	12,564
Denver & Salt Lake .....	215	71,641	86,056	157,697	19,039	17,310	37,603	4,401	81,761	83,690	.....	4,000	79,690	24,544
Galveston, Harrisburg & San Antonio .....	1,338	772,542	278,932	1,051,474	95,217	185,896	32,216	377,600	379,777	379,777	—3,480	90,000	286,297	20,202
Georgia .....	307	146,644	88,749	235,393	37,319	47,257	127,082	9,347	232,190	18,819	.....	2,950	15,869	14,185
Georgia, Southern & Florida .....	395	93,703	67,594	161,297	26,246	8,431	82,221	6,997	168,341	14,153	.....	10,658	3,495	—25,372
Gulf & Ship Island .....	308	133,144	40,912	174,056	21,538	3,146	46,116	8,252	110,549	74,734	.....	7,056	67,678	9,122
Houston, East & West Texas .....	191	64,830	39,222	104,052	17,934	1,891	37,988	3,846	75,266	34,986	.....	9,575	25,411	—15,440
Houston & Texas Central .....	79	373,671	204,775	578,446	83,059	104,880	239,336	17,364	456,421	164,002	—11	50,000	113,991	—48,689
Lehigh & Hudson River .....	87	136,533	6,848	143,381	35,760	22,561	56,866	3,353	119,873	31,287	.....	4,000	22,287	—12,084
Louisiana Western .....	208	114,232	64,630	178,862	186,712	20,053	56,032	5,779	133,118	53,594	310	11,875	42,029	—28,179
Missouri, Oklahoma & Gulf .....	332	69,610	24,160	93,770	14,892	5,746	40,755	5,353	82,646	15,705	544	6,000	10,249	11,181
Missouri, Okla. & Gulf Ry. Co. of Texas .....	19	8,421	596	9,017	1,699	182	4,515	575	7,927	1,291	.....	171	1,120	1,814
Mobile & Ohio .....	1,122	863,066	148,070	1,011,136	131,051	208,446	387,200	29,640	795,485	271,907	—1,074	33,881	236,952	—1,616
Morgan's La. & Tex. R. R. & S. Co. ....	404	231,812	100,300	332,112	42,254	75,549	148,683	10,430	289,693	70,104	—1,314	18,250	50,540	49,218
Oregon Short Line .....	1,982	1,295,499	520,948	1,816,447	233,720	35,880	464,097	52,758	1,040,601	196,287	1,816	132,300	765,803	—228,575
Peoria & Eastern .....	352	226,847	72,884	300,000	44,992	85,680	106,806	6,840	248,074	74,939	.....	10,400	64,539	69,925
St. Louis Southern of Texas .....	811	240,161	127,653	367,814	107,415	86,378	161,248	18,983	386,141	6,650	—450	17,800	—11,600	—57,505
Southern in Mississippi .....	281	47,281	35,523	82,804	27,054	11,058	39,564	3,456	83,325	6,432	.....	6,812	—380	4,078
Texas & New Orleans .....	458	230,591	120,150	350,741	64,060	79,681	141,481	12,553	303,391	63,919	14,377	35,000	43,296	—12,241
Texas & Pacific .....	1,885	941,023	461,374	1,402,397	250,065	255,873	583,353	41,280	1,164,004	319,655	4,841	48,000	276,496	175,970
Union R. R. of Pennsylvania .....	31	.....	.....	.....	56,854	96,298	178,737	2,482	334,471	154,364	3,012	10,000	147,376	81,354
Virginia & Southwestern .....	240	152,280	18,126	170,406	22,495	38,432	48,112	3,708	115,073	59,330	.....	5,909	53,421	8,772
Western Maryland .....	661	586,622	137,684	724,306	122,274	96,660	299,506	15,834	556,492	198,054	.....	19,000	179,054	—13,910
Western Pacific .....	934	458,455	166,174	624,629	116,396	59,502	203,787	26,064	434,333	205,555	735	29,667	176,623	52,916
Western Ry. of Alabama .....	133	51,882	46,490	98,372	21,134	24,271	32,244	5,640	88,999	18,331	—150	4,838	13,343	462

TWO MONTHS OF FISCAL YEAR, 1914.

Alabama Great Southern .....	309	\$557,445	\$253,447	\$810,892	\$103,990	\$25,993	\$233,943	\$18,287	\$667,742	\$212,721	—\$906	\$31,000	\$180,815	—\$17,980
Ann Arbor .....	292	225,160	126,502	351,662	49,877	9,732	123,762	12,961	244,428	132,734	—259	27,860	104,615	1,043
Atlanta & West Point .....	23	89,886	88,292	178,178	34,130	42,951	63,208	9,316	159,850	36,163	355	12,969	23,549	—9,875
Baltimore & Ohio—System .....	4,456	14,013,309	3,298,595	17,311,904	2,522,847	387,506	6,478,151	381,825	12,340,378	5,741,586	—146,162	525,541	5,069,883	418,107
Baltimore & Ohio Terminal .....	77	.....	.....	.....	1,854	309,348	1,505	9,828	229,984	79,364	2,079	32,104	49,339	—11,901
Birmingham Southern .....	26	288,912	8,960	297,872	16,553	2,032	45,863	4,548	106,582	162,715	.....	3,610	157,092	3,336
Birmingham Southern .....	43	138,153	2,339	140,492	31,507	27,031	74,206	8,520	142,327	88,296	.....	3,610	84,686	26,426
Central of New Jersey .....	676	3,425,258	1,302,971	4,728,229	520,777	723,187	1,441,986	88,230	2,843,963	2,048,342	178,874	205,310	2,021,906	—332,622
Central Vermont .....	536	461,033	245,616	706,649	133,674	130,449	344,541	14,025	658,329	103,203	1,628	31,000	73,831	—65,200
Chicago & Alton .....	1,032	1,760,000	853,834	2,613,834	307,750	516,319	962,817	68,569	1,976,765	824,874	—4,900	78,000	741,974	—29,643
Chicago & Northwestern .....	8,000	9,564,539	4,312,208	13,876,747	2,170,052	2,110,310	5,302,750	283,517	10,727,848	4,305,809	1,358	640,000	3,757,167	—72,891
Chicago Great Western .....	1,496	1,667,859	652,463	2,320,322	355,292	377,133	846,869	71,059	1,750,666	752,809	1,878	77,501	677,386	87,708

## REVENUES AND EXPENSES OF RAILWAYS.

TWO MONTHS OF FISCAL YEAR, 1914—CONTINUED.

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total.	Inc. total.	Way and structures.	Maintenance of equipment.					
Chicago, Indianapolis & Louisville.....	617	805,115	328,668	1,133,783	1,232,627	187,747	182,288	369,980	.....	48,744	321,236	13,598
Cincinnati, Hamilton & Dayton.....	1,015	1,286,937	353,471	1,640,408	1,852,025	281,420	293,809	357,182	.....	69,425	287,757	-211,369
Cincinnati, New Orleans & Texas Pacific.....	337	1,240,155	340,038	1,580,193	1,667,770	174,782	407,639	510,600	.....	58,000	451,217	-40,794
Cincinnati Northern.....	245	181,370	57,217	238,587	251,378	54,481	77,287	.....	.....	11,000	-11,558	51,696
Cleveland, Cincinnati, Chic. & St. Louis.....	2,014	3,987,058	1,747,808	5,734,866	6,261,415	1,106,171	1,573,989	778,229	4,601	207,600	575,230	-1,074,809
Cumberland Valley.....	162	414,873	145,238	560,111	584,498	132,591	54,218	185,151	307	11,404	174,054	-15,847
Delaware & Hudson Co.—R. R. Dept.....	854	3,392,799	833,540	4,226,339	4,367,117	328,817	500,880	1,855,374	4,351	99,400	1,751,623	33,968
Denver & Salt Lake.....	215	1,331,014	295,049	1,626,063	1,743,113	46,056	35,643	127,327	.....	8,000	119,327	29,615
Galveston, Harrisburg & San Antonio.....	1,338	1,311,874	555,166	1,867,040	1,971,686	225,062	378,348	471,682	4,759	125,471	341,452	-65,470
Georgia.....	307	281,630	166,062	447,692	480,067	75,123	87,974	37,073	.....	5,914	31,159	15,044
Georgia, Southern & Florida.....	395	206,737	132,635	339,372	385,601	52,103	82,720	46,010	.....	21,316	24,694	-27,550
Gulf & Ship Island.....	308	259,932	84,288	344,220	366,777	42,215	57,558	154,117	.....	14,212	139,905	30,591
Houston, East & West Texas.....	191	134,901	78,044	212,945	214,765	41,164	38,941	55,357	.....	13,265	42,092	-31,572
Houston & Texas Central.....	789	734,041	396,016	1,130,057	1,205,024	173,688	184,153	252,323	.....	69,666	182,424	-108,994
Lehigh & Hudson River.....	97	270,860	111,671	382,531	400,741	74,617	42,634	23,073	.....	8,000	53,026	-30,067
Louisiana Western.....	208	216,484	128,910	345,394	362,737	40,276	91,262	94,606	.....	18,450	76,884	-53,662
Maine Central.....	1,207	1,094,526	837,080	1,931,606	2,056,863	362,200	282,801	557,016	674	18,450	459,113	-76,990
Michigan Central.....	1,819	3,486,826	1,959,640	5,446,466	6,023,866	1,013,457	1,039,054	1,316,113	403	232,000	1,084,516	-489,873
Midland Valley.....	373	176,894	80,707	257,601	270,546	57,337	52,668	51,664	96	11,973	39,787	10,707
Minneapolis & St. Louis.....	1,586	1,075,978	385,154	1,461,132	1,560,994	209,952	221,882	486,168	7	65,037	421,138	-12,034
Minneapolis, St. Paul & Sault Ste. Marie.....	3,976	3,479,191	1,408,261	4,887,452	5,195,482	793,336	804,004	1,784,818	43,541	238,140	1,590,219	-97,690
Missouri & North Arkansas.....	365	136,815	84,494	221,309	233,366	53,667	34,099	42,196	.....	11,000	31,196	39,987
Missouri, Kansas & Texas System.....	3,817	3,426,208	1,797,524	5,223,732	5,586,178	973,777	685,284	1,609,763	18,811	213,995	1,376,957	211,866
Missouri, Oklahoma & Gulf.....	332	141,123	47,922	189,045	196,248	35,368	29,080	28,829	998	12,000	17,827	15,430
Missouri, Okla. & Gulf Ry. Co. of Texas.....	19	15,791	1,118	16,909	17,224	1,497	3,673	1,390	.....	342	1,048	4,365
Missouri Pacific.....	3,920	3,742,360	966,973	4,709,333	5,103,453	754,559	933,626	1,998,352	8,248	186,780	1,003,324	-43,591
Mobile & Ohio.....	1,122	1,731,410	275,483	2,006,893	2,124,411	252,831	406,460	538,565	2,223	64,553	471,789	25,440
Monongahela.....	67	261,777	6,066	267,843	271,976	39,589	13,554	162,949	.....	4,700	158,249	22,087
Monongahela Connecting.....	6	.....	.....	.....	.....	25,559	31,790	32,555	.....	5,366	27,189	34,722
Morgan's L. & Tex. R. R. & S. Co.....	404	440,386	201,858	642,244	692,231	86,160	160,236	103,720	2,572	36,500	64,648	35,002
Nashville, Chattanooga & St. Louis.....	1,231	1,372,992	568,816	1,941,808	2,077,943	337,729	444,140	354,586	1,156	50,680	302,750	-119,996
Nevada Northern.....	165	257,147	29,803	286,950	294,034	33,742	34,578	149,445	.....	13,302	136,143	20,444
New Orleans & North Eastern.....	196	539,748	118,130	657,878	705,583	75,587	133,629	191,260	161	31,600	159,499	53,917
New Orleans Great Northern.....	283	223,559	73,135	296,694	321,897	45,244	27,313	136,489	176	4,667	131,646	16,706
New Orleans, Mobile & Chicago.....	404	271,343	69,830	341,173	364,386	52,896	35,358	134,045	206	12,873	120,966	12,138
New York, Chicago & St. Louis.....	565	1,557,234	349,330	1,906,564	2,079,462	315,111	340,926	352,954	3,119	72,000	277,935	-97,490
New York Central & Hudson River.....	3,751	11,338,527	7,373,178	18,711,705	20,734,768	3,229,105	3,826,262	5,601,417	30,306	1,077,059	4,494,052	-37,258
New York, New Haven & Hartford.....	2,113	5,516,747	3,510,574	9,027,321	11,878,888	1,556,620	1,560,936	3,979,899	10,423	640,000	3,350,322	-1,316,540
New York, Ontario & Western.....	566	1,170,443	678,312	1,848,755	2,000,000	288,199	264,030	714,714	4,344	38,000	710,714	-134,746
New York, Philadelphia & Norfolk.....	112	609,709	769,285	1,378,994	1,517,171	60,062	151,171	254,513	.....	16,000	198,513	-14,352
New York, Susquehanna & Western.....	154	315,998	112,095	428,093	483,992	65,621	65,621	368,244	7,416	35,297	87,857	3,116
Norfolk & Western.....	2,035	6,563,554	942,538	7,506,092	8,248,630	1,049,318	1,519,933	2,576,215	3,948	250,000	2,322,267	-247,013
Norfolk Southern.....	569	311,996	161,960	473,956	529,204	64,741	76,915	183,983	19	18,420	165,544	7,455
Norfolk Central.....	472	1,625,261	517,832	2,143,093	2,283,228	325,746	494,884	313,800	2,176	81,991	233,985	-94,054
Northern Pacific.....	6,312	7,865,508	3,426,160	11,291,668	12,086,259	2,245,343	1,461,807	4,230,091	94,395	694,191	3,630,295	-298,085
Northwestern Pacific.....	401	291,417	504,162	795,579	842,444	96,364	71,415	400,728	.....	30,200	370,528	36,511
Oregon Short Line.....	1,982	2,492,064	1,038,264	3,530,328	3,759,210	542,008	473,707	1,652,005	1,247	265,720	1,387,622	-508,431
Oregon, Washington R. R. & Nav. Co.....	1,974	1,921,486	1,001,198	2,922,684	3,124,436	480,750	33,299	1,042,184	4,087	25,936	1,017,161	-253,334
Pecos & Northern Texas.....	482	272,609	91,483	364,092	385,830	46,342	78,293	125,864	.....	13,468	112,366	9,501
Pennsylvania Co.....	1,751	9,430,261	1,994,156	11,424,417	12,507,160	1,639,701	2,151,318	2,595,966	19,831	501,415	3,481,938	-566,680
Pennsylvania Railroad.....	4,032	23,001,221	7,430,927	30,432,148	32,434,152	4,043,602	6,347,528	9,531,184	312,795	1,223,692	7,995,319	-233,609
Peoria & Eastern.....	352	396,594	133,978	530,572	586,750	97,006	162,604	82,437	.....	20,800	61,637	134,037
Pere Marquette.....	2,325	1,648,070	931,142	2,579,212	2,838,792	587,661	522,319	403,045	13,409	99,570	290,066	-368,842
Philadelphia & Reading.....	1,020	6,149,992	1,410,538	7,560,530	8,248,630	912,382	1,340,174	2,837,190	73,379	205,609	2,704,959	-462,928
Philadelphia, Baltimore & Washington.....	713	1,875,757	1,460,027	3,335,784	3,670,015	626,131	708,965	618,653	.....	107,436	511,217	-282,005
Pittsburgh & Lake Erie.....	222	2,995,752	387,896	3,383,648	3,508,137	397,181	641,708	1,581,922	211	114,000	1,468,133	-330,501
Pittsburgh, Cincinnati, Chic. & St. Louis.....	1,472	5,300,324	1,684,998	6,985,322	7,805,053	1,200,138	1,562,640	1,883,634	979	289,013	1,593,642	-434,434
Pittsburgh, Shawmut & Northern.....	282	333,950	25,023	358,973	383,996	91,824	93,090	39,913	.....	3,644	36,269	33,322
Port Reading.....	21	184,516	188,576	373,092	391,568	32,148	227	99,533	3,719	75,334	75,334	-62,108
Richmond, Fredericksburg & Potomac.....	88	247,182	147,074	394,256	451,429	47,936	53,517	161,156	729	15,818	144,609	-28,914
Rutland.....	468	340,826	271,962	612,788	711,244	78,776	129,730	217,904	15	34,128	183,761	-4,549
St. Joseph & Grand Island.....	319	218,537	69,599	288,136	311,883	61,703	40,906	68,475	72	12,488	55,915	-5,915
St. Louis & San Francisco.....	4,742	5,070,366	2,092,837	7,163,203	7,667,579	1,072,579	1,221,759	2,650,916	.....	227,188	2,423,728	407,949
St. Louis, Brownsville & Mexico.....	518	230,417	162,397	392,814	431,552	61,416	48,237	141,792	.....	11,000	130,792	44,295
St. Louis, Iron Mountain & Southern.....	3,365	4,045,675	1,119,107	5,164,782	5,528,832	764,587	928,965	1,814,980	8,094	194,570	1,612,316	-41,950
St. Louis Merchants' Bridge Terminal.....	9	328,134	813	328,947	328,134	79,764	27,048	42,770	.....	11,200	31,570	-43,862
St. Louis, San Francisco & Texas.....	244	195,653	71,298	266,951	283,749	45,024	30,029	100,255	.....	2,450	97,805	52,058
St. Louis, Southwestern.....	906	1,014,841	268,979	1,283,820	1,359,535	135,307	268,753	559,845	2,996	60,464	496,385	12,541
St. Louis Southwestern of Texas.....	811	497,111	240,789	737,900	792,719	218,556	179,946	782,788	836	35,600	26,505	-193,096
San Antonio & Aransas Pass.....	724	558,003	293,746	851,749	896,414	143,705	135,581	264,637	.....	24,000	240,637	-33,836

## Railway Officers.

### Executive, Financial and Legal Officers.

W. H. Vincent has been appointed assistant auditor of the Georgia Railroad, with office at Augusta, Ga.

E. A. Chavannes is appointed auditor of the Pacific & Idaho Northern Railway and the Central Idaho Telegraph & Telephone Company, with office at New Meadows, Adams County, Idaho, succeeding W. R. Mozier, resigned.

Edmund Deschenes, Jr., whose appointment as auditor of the Central Vermont, with headquarters at St. Albans, Vt., has been announced in these columns, was born on September 7, 1878, at St. Albans, and was educated in the grammar schools of his native town. He began railway work in March, 1893, as a messenger on the Central Vermont, and subsequently was clerk in charge of freight accounts, traveling auditor, chief clerk of passenger accounts, chief clerk to auditor, and now becomes auditor as above noted.

William Hough, first assistant auditor of the Pullman Company at Chicago, has been appointed general auditor, succeeding F. C. N. Robertson, deceased, and Frederick L. Simmons, second assistant auditor, at Chicago, has been appointed assistant general auditor. E. C. Morris, statistician, has been appointed auditor of the manufacturing department. George S. Seymour, third assistant auditor, has been appointed auditor of miscellaneous accounts, and Wm. Riley, ticket auditor, has been appointed auditor of ticket accounts.

William J. Cunningham, whose appointment as vice-president's assistant of the New York, New Haven & Hartford was announced in our issue of last week, was born April 29, 1875, at



W. J. Cunningham.

St. John, N. B. He began railway work in 1892 with the Canadian Pacific as stenographer and ticket clerk in the passenger department at St. John, N. B., and Boston, Mass. In 1896 he went to the Boston & Albany as clerk in the superintendent's office at Boston, and three years later became statistical clerk to the general manager of the New York, New Haven & Hartford. From 1901 to 1907 he was employed in various capacities by the Delaware, Lackawanna & Western, his last position being assistant chief clerk to the general superintendent. In November, 1907, he became associated with J. H. Hustis (then assistant general manager of the Boston & Albany) as statistician. When the Harvard Business School was established in 1908 Mr. Cunningham was engaged for two years as lecturer on railroad operation. In September, 1910, he was appointed assistant professor of transportation, but continued to act on Mr. Hustis' staff as consulting statistician. Coincident with the election of Mr. Hustis as vice-president of the New York, New Haven & Hartford, Prof. Cunningham was appointed vice-president's assistant, with headquarters at New Haven, Conn., as above noted. His title will be changed to president's assistant when the by-laws of the company are changed on October 22 and Mr. Hustis becomes president. To permit of the acceptance of this appointment for two years Harvard University has granted partial leave of absence for that time, and Prof. Cunningham will continue to lecture at Harvard on one day per week. During the summer of 1910 Prof. Cunningham made a special study of British railways, and the following summer did work of a similar nature on the Harriman Lines with special reference to the Unit system, and

also on the Santa Fe and the Frisco lines. In the summer of 1912 he made a study of the Prussian-Hessian railways, and during the past summer he was engaged on special work for Vice-President Seger of the Union Pacific system.

Louis Judson Hensley, whose appointment as auditor of the Kansas City Southern, with headquarters at Kansas City, Mo.,



L. J. Hensley.

has already been announced in these columns, was born October 14, 1879, at Buckner, Mo. He was educated in the public schools of Independence, Mo., and began railway work January 22, 1903, with the Kansas City Southern as assistant bill clerk in the auditor's office. He has remained with that company continuously, the first six years occupying successively the positions of bookkeeper, traveling material clerk and voucher. He was then on December 1, 1908, made chief clerk to the vice-president and auditor, and on February 1, 1912, he became assistant auditor. Mr. Hensley's

promotion to the position of auditor was effective September 1 of this year.

James G. Woodworth, who has been elected vice-president in charge of traffic of the Northern Pacific, with headquarters at St. Paul, Minn., was born October 31, 1864, at Hillsdale, Mich. He



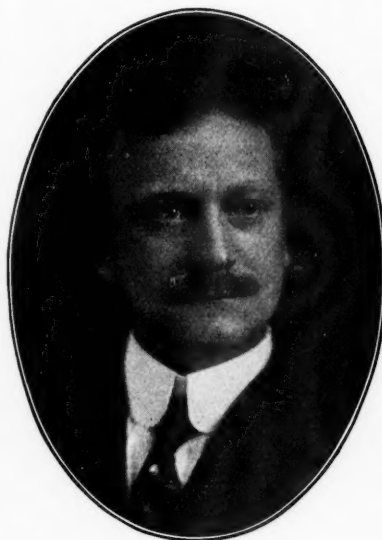
J. G. Woodworth.

began railway work in 1879 as an office boy in the general freight department of the Chicago & North Western, and from May, 1880, to March, 1883, was telegraph operator and station agent at De Smet, S. Dak. He then became chief clerk in the general agent's office of the Chicago, St. Paul, Minneapolis & Omaha at Minneapolis, Minn., and in September of the following year went to the Union Pacific as freight solicitor at Portland, Ore. From January, 1886, to September, 1888, he was successively traveling freight agent and chief clerk in the general freight department of the Oregon Rail-

way & Navigation Company. He was then made assistant general freight agent of that company, and in December, 1889, was appointed to a similar position on the Union Pacific, with headquarters at Portland. He was advanced to general freight agent of the Pacific division in July of the following year, and eight months later became assistant general western freight agent at Portland, being transferred to Omaha, Neb., in November, 1892, as assistant general freight agent. Mr. Woodworth left the Union Pacific in July, 1893, and for one year was general freight agent of the Iowa Central. He returned to the Oregon Railway & Navigation Company as assistant to the receiver and general manager in July, 1894, and two years later became assistant to the president of that company. He was afterwards general freight agent from October, 1897, to October, 1899, when he became traffic manager of the Pacific Coast Company. He left the latter company to accept the position of assistant to the first

vice-president of the Chicago, Burlington & Quincy in January, 1902, where he remained for three years, resigning to become traffic manager of the Northern Pacific. He held the latter office at the time of his recent election to the vice-presidency, as above noted.

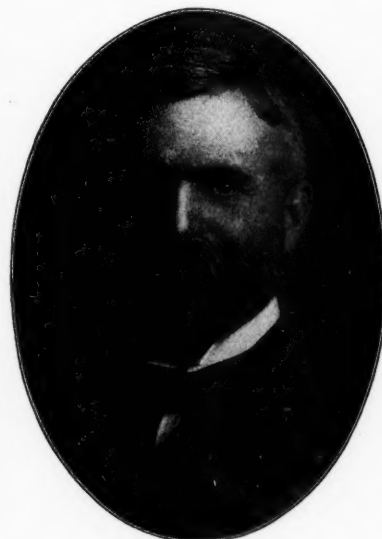
Clement William Nelson, assistant general manager of the St. Louis Southwestern, has been appointed assistant to the



C. W. Nelson.

president with headquarters at St. Louis, Mo., and the former position has been abolished, effective October 7. Mr. Nelson was born July 12, 1870, at Morristown, Ill., and received a public school education, 1878 to 1889. He began railway work in June, 1889, with the American Express Company (Great Northern Railway). From September, 1890, to September, 1896, he was clerk and timekeeper in various departments of the Great Northern, and then until June, 1899, was chief clerk to superintendent on various divisions. Mr. Nelson went to the St. Louis Southwestern in July, 1899, as chief clerk to the general superintendent, and in March of the following year was promoted to chief clerk to the vice-president and general manager. He was made assistant general manager in May, 1906, which position he held until his recent appointment as assistant to the president, as above noted.

Major Charles Hine, vice-president of the Southern Pacific of Mexico and the Arizona Eastern, has resigned, effective October 16, to return to the field of expert railway work along organization and efficiency lines.



Charles Hine.

He already has been employed to do work along these lines on the Canadian Northern and while engaged on this his headquarters will be at Toronto, Ont. His permanent headquarters, however, will be at New York City. Major Hine was born March 15, 1867, at Vienna, Va., and was graduated from the Washington (D. C.) high school in 1885 and from the United States Military Academy at West Point in 1891. He was graduated from the Cincinnati Law School and admitted to the bar in 1893 while serving as lieutenant in the United States Army. He began railway work in April, 1895, and for three years was employed by the Cleveland, Cincinnati, Chicago & St. Louis successively as freight brakeman, switchman, yardmaster, conductor, chief clerk and trainmaster of the Cincinnati-Indianapolis district. He was then granted leave of absence in April, 1898, to serve in the Santiago campaign of the Spanish-American war as Major U. S. Volunteers, returning to the Big Four in February, 1899, as trainmaster at Cincinnati, O. In September of that year he was made general superintendent of the Findlay, Ft. Wayne & Western. He was inspector of safety appliances for the Interstate Commerce Commission in 1900, resigning November 1 of that year to go to the Chicago & Alton as assistant superintendent

at Roodhouse, Ill. Major Hine was receiver of the Washington, Arlington & Falls Church Electric railway 1907 to 1908, and subsequently held various staff positions in special work and reports on the Chicago & Alton, Chicago, Rock Island & Pacific, St. Louis & San Francisco, Chicago & Eastern Illinois, Chicago, Burlington & Quincy, Erie, Intercolonial, Prince Edward Island, Delaware & Hudson, Georgia & Florida railroads and National Railways of Mexico as well as other smaller roads. While with Gunn, Richards & Company, in 1907, he assisted in a revision of the business methods in the Department of the Interior at Washington, D. C. As temporary special representative of President Taft in 1910, he outlined a programme for improving organization and methods of executive departments of the United States government. From July, 1908, to December, 1911, as organization expert for the Union Pacific and Southern Pacific, he originated and installed the Hine unit system of organization. He was then in January, 1912, made vice-president and general manager of the Southern Pacific of Mexico and the Arizona Eastern, which position he now resigns, as above stated. Major Hine is the author of "Letters from an Old Railway Official to His Son," published by the *Railway Age Gazette*, and of other works.

#### Operating Officers.

John S. King has been appointed terminal trainmaster of the Cincinnati, New Orleans & Texas Pacific at Cincinnati, O.

O. E. Coyne, chief train dispatcher of the Missouri Pacific at Jefferson City, Mo., has been appointed trainmaster at that place, succeeding D. O. Ouellet, who has been transferred to Sedalia, Mo., in a similar capacity. W. J. Henry succeeds Mr. Coyne.

The position of general superintendent of freight transportation of the New York Central Lines at Chicago has been abolished. H. J. Merrick, who held that office, has resumed his former position as superintendent of freight transportation of the Lake Shore & Michigan Southern, with headquarters at Cleveland, O.

Edward J. Devans, whose appointment as general superintendent of the Buffalo, Rochester & Pittsburgh, with headquarters at Rochester, N. Y., has been announced in these columns, was



E. J. Devans.

born on January 27, 1867, at Medina, N. Y., and was educated in the public schools. He began railway work in May, 1883, as an operator on the New York Central & Hudson River, and then held the same position on the Delaware, Lackawanna & Western and the West Shore until October, 1887, when he went to the Buffalo, Rochester & Pittsburgh as agent and operator. Two years later he was transferred to the superintendent's office as clerk, and in April, 1893, went to the train dispatcher's office as copier, becoming train dispatcher in August of the same year. In September, 1899, he was appointed chief dispatcher and trainmaster, and in May, 1905, was made special representative to the general manager. He was promoted to superintendent in March, 1907, which position he held at the time of his recent appointment as general superintendent of the same road, as above noted.

#### Traffic Officers.

J. Lee Barrett has resigned as northern passenger agent of the Cincinnati, Hamilton & Dayton at Detroit, Mich., to become secretary of the Detroit Convention and Tourist Bureau.

George A. Jobs has been appointed traveling immigration agent of the Northern Pacific, with headquarters at Cincinnati, O., to succeed J. C. Eaton, recently appointed general agent of the passenger department at Cincinnati.

C. F. Gourley has been appointed New England passenger agent of the Boston & Maine, with headquarters at Boston, Mass., succeeding A. C. Robinson, assigned to other duties. Mr. Gourley will also act as immigrant agent.

F. P. Cruice, assistant general passenger agent of the Atchison, Topeka & Santa Fe at Prescott, Ariz., has been appointed assistant general freight and passenger agent of the Santa Fe Coast Lines, with headquarters at Prescott, in charge of solicitation.

Brooks G. Brown, whose appointment as assistant general freight agent of the Southern Railway, with headquarters at Atlanta, Ga., has been announced in these columns, was born on December 2, 1880, at Decatur, Ga., and graduated from high school. On December 1, 1899, he began railway work in the office of the division freight agent of the Southern Railway at Atlanta, and later was transferred to Washington, D. C. He was subsequently rate clerk in the general freight office at Atlanta, and in November, 1905, became traveling freight agent at Spartanburg, S. C. On January 1, 1907, he was made executive clerk in the general freight office of the same road, at Atlanta, and from June, 1909, to the following August, was assistant chief clerk, later becoming chief rate clerk in the same office. He was appointed chief clerk to the general freight agent of the same road in June, 1911, and now becomes assistant general freight agent, as above noted. His entire service has been with the Southern Railway.

#### Engineering and Rolling Stock Officers.

George E. Smart has been appointed master car builder of the Intercolonial and the Prince Edward Island railways, with headquarters at Moncton, N. B.

F. W. Kane, office engineer of the Missouri, Kansas & Texas, has been appointed assistant chief engineer, with headquarters at Dallas, Tex., and his former position has been abolished.

P. Aagard, chief building inspector of the Illinois Central, has been appointed superintendent of buildings, with headquarters at Chicago, succeeding T. J. Fullem, assigned to other duties and the office of chief building inspector is abolished.

George A. Moriarty, whose appointment as master mechanic of the New York, New Haven & Hartford, with headquarters at Boston, Mass., has been announced in these columns, was born on July 24, 1872, at Connellsville, Pa., and was educated in the schools of Cincinnati and the high schools of Newark, Ohio. He began railway work in February, 1887, as a machinist apprentice on the Baltimore & Ohio, and from March, 1891, to September, 1895, was machinist successively on the Pennsylvania Railroad, the Baltimore & Ohio, the Louisville & Nashville, the Cincinnati, New Orleans & Texas Pacific, and the Cleveland, Cincinnati, Chicago & St. Louis. He then returned to the service of the Baltimore & Ohio as machinist, and was subsequently machine shop foreman and general foreman on the same road. From August, 1898, to July of the following year he was in a contract shop, and then to May, 1903, was first a gang foreman on the Baltimore & Ohio, then roundhouse foreman, and later general foreman. In June, 1903, he went to the Erie as general foreman, and later became master mechanic, leaving that company in August, 1907, to become master mechanic of the New York, New Haven & Hartford on the Old Colony division at Providence, R. I., which position he held at the time of his recent appointment as master mechanic of the same road, with headquarters at Boston, Mass., as above noted.



G. A. Moriarty.

J. E. O'Brien, superintendent of motive power of the Western Pacific at Jeffery Shops, Cal., has been appointed assistant mechanical superintendent of the Missouri Pacific and St. Louis, Iron Mountain & Southern, with headquarters at St. Louis, Mo., effective October 8.

C. E. Denney, signal engineer of the Lake Shore & Michigan Southern, at Cleveland, Ohio, has been appointed special engineer on the staff of Vice-President J. J. Berner, at Chicago, of the New York Central Lines West, and F. B. Wiegand, assistant signal engineer at Cleveland, succeeds Mr. Denney.

The jurisdiction of D. R. MacBain, superintendent of motive power of the Chicago, Indiana & Southern, having been withdrawn, J. T. Flavin, master mechanic, will assume charge of the locomotive and car departments of that road, reporting to the superintendent. E. M. Wilcox is appointed general car foreman, reporting to the master mechanic. Headquarters, Gibson, Ind. Effective October 1.

A. F. Blaess, whose appointment as district engineer of the Yazoo & Mississippi Valley, with headquarters at Memphis, Tenn., has already been announced in these columns, was born in 1871 at Ann Arbor, Mich. He was graduated from the University of Michigan in 1895, with the degree of C. E., and began railway work in July of that year with the Detroit & Mackinac. He was employed as chainman and rodman on the engineering corps making preliminary and location surveys during 1895 and 1896, and the following year he entered the service of the Illinois Central, being a track apprentice for the first three months. He was then transferred to the engineering department, where he was employed in various positions, from rodman to assistant engineer in the construction and maintenance department, until 1902, when he was made road supervisor. He was advanced to roadmaster in 1905, and in 1911 became assistant engineer maintenance of way, with jurisdiction also over the Yazoo & Mississippi Valley. Mr. Blaess remained in the latter position until his recent appointment as district engineer of the Yazoo & Mississippi Valley, as above noted.

#### Purchasing Officers.

William R. Shoop, purchasing agent of the Buffalo, Rochester & Pittsburgh, at Rochester, N. Y., has been appointed manager of purchases and stores, with headquarters at Rochester, effective November 1.

#### Special Officers.

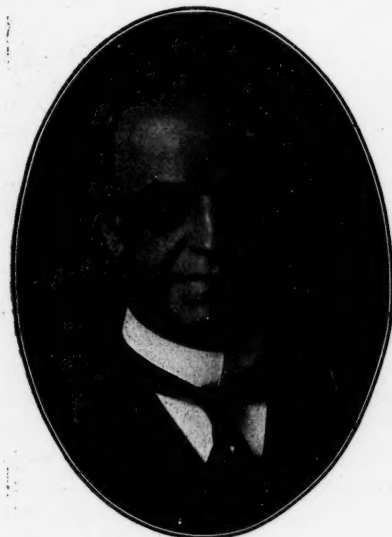
George A. McNicholl has been appointed commissioner of the colonization and industrial department of the Grand Trunk Pacific, with office at Prince Rupert, B. C.

#### OBITUARY.

William E. Barnett, formerly from January, 1900, to 1904, third vice-president of the New York, New Haven & Hartford, died at Pinehurst, N. C., on October 9. He was born on February 20, 1845, at Charleston, S. C., and graduated from Yale with the class of 1864, and later completed a course in the Albany Law School. His first railway work was as private secretary to President Bishop of the New York & New Haven in 1869. He was subsequently executive secretary of its successor, the New York, New Haven & Hartford, which position he held until 1887. Later he was made attorney, and in 1900 became vice-president at the head of the department of law, real estate and taxes.

Charles A. Florence, export and import agent of the Illinois Central at Chicago, died in that city on October 7. He was born on June 8, 1857 at Chicago, and began railway work in 1877 as a clerk. From 1879 to 1887 he was agent in the Chicago office of the Iowa Railroad Land Company and then to 1890 was traveling passenger agent of the Illinois Central for Canada and had been in the continuous service of that road ever since. From February, to November, 1890, he was New England passenger agent, and then to September, 1897, was general agent of the freight and passenger department for New England at Boston, Mass., becoming general eastern freight agent in September, 1897, at New York. In September, 1910, he was appointed assistant general freight agent at Chicago; in May, 1911, he was made assistant general foreign freight agent, and since March, 1912, had been export and import agent of the same road.

Joseph Robinson Parrott, president of the Florida East Coast, with headquarters at St. Augustine, Fla., died suddenly on October 13 at his summer camp at Oxford, Me. He was born on



J. R. Parrott.

October 30, 1859, at Oxford, and was educated at Yale, graduating also from the law school. His first railway work was as attorney on the Jacksonville, Tampa & Key West, and he was subsequently appointed general counsel and land commissioner, which position he held until June, 1892; from 1890 to 1892 he was also receiver of the Florida Southern; was general counsel of the Jacksonville, St. Augustine & Halifax River and its successor, the Jacksonville, St. Augustine & Indian River. In 1902 he became vice-president of the same road, which is now known as the Florida

East Coast, and in 1910 was elected president of the same road. He had been closely associated with the late Henry M. Flagler in the railroad and hotel business, and assisted Mr. Flagler in building the oversea extension of the Florida East Coast to Key West.

William McCullough Grafton, signal engineer of the Pennsylvania Lines West of Pittsburgh, Pa., with headquarters at that city, died on October 10, at Atlantic City, N. J. He was born on



W. McC. Grafton.

October 12, 1854, at Yellow Creek, Ohio, and began railway work in 1870, as chief mileage clerk on the Pittsburgh, Fort Wayne & Chicago. One year later he became station agent on the same road and subsequently became coal inspector on the Pittsburgh, Cincinnati & St. Louis. From February, 1877, to July, 1881, he was conductor on the Potomac, Fredericksburg & Piedmont, and then to January, 1882, was assistant superintendent of the same road, becoming general superintendent of that road in 1882. From 1885 to 1886 he was out of railway service and then was appointed supervisor of signals on the Pennsylvania Lines West of Pittsburgh. Mr. Grafton had been signal engineer of the Pennsylvania Lines West of Pittsburgh since August, 1889, and since January, 1905, was signal engineer also of the Vandalia Railroad. He was one of the most accomplished engineers in this field, but was a modest man and was not prominent in the Signal Association. It was he who first made an extensive installation of the now popular three-position automatic block signals. The Railway Signal Association at the meeting in Nashville, Tenn., on October 14, adopted resolutions testifying to his worth. He was a pioneer among signal engineers and had not only the courage of his convictions, but the energy and determination to bring them to a realization. He had a broad conception of the art of signaling. His work has had and will continue to have an important influence on the development of this branch of railway engineering, and his upright and useful life as a gentleman and a railway officer is a cherished example to his friends and associates.

## Equipment and Supplies.

### LOCOMOTIVE BUILDING.

THE CHICAGO & NORTH WESTERN has ordered 20 mikado locomotives from the American Locomotive Company.

THE CHICAGO & WESTERN INDIANA has ordered 4 mogul locomotives and 6 switching locomotives from the Lima Locomotive Corporation.

THE CENTRAL OF NEW JERSEY has ordered 5 eight-wheel switching locomotives and 10 ten-wheel locomotives from the Baldwin Locomotive Works.

THE LAKESIDE & MARBLEHEAD has ordered 1 six-wheel switching locomotive from the American Locomotive Company. The dimensions of the cylinders will be 21 in. x 28 in., the diameter of the driving wheels will be 51 in., the steam pressure will be 180 lbs. and the total weight in working order will be 165,000 lbs.

THE CENTRAL RAILWAY OF BRAZIL has ordered 6 ten-wheel locomotives from the American Locomotive Company. The dimensions of the cylinders will be 16 in. x 20 in., the diameter of the driving wheels will be 48 in., the steam pressure will be 180 lbs. and the total weight in working order will be 80,000 lbs.

THE DORADO EXTENSION RAILWAY OF COLOMBIA has ordered 2 prairie type locomotives from the American Locomotive Company. The dimensions of the cylinders will be 15 in. x 20 in., the diameter of the driving wheels will be 40 in., the steam pressure will be 175 lbs. and the total weight in working order will be 82,000 lbs.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered 6 consolidation locomotives and 4 Pacific type locomotives from the American Locomotive Company. The consolidation locomotives will have 25 in. x 30 in. cylinders, 63 in. driving wheels, a steam pressure of 170 lbs. and a total weight in working order of 226,000 lbs. The Pacific type locomotives will have 25 in. x 26 in. cylinders, 75 in. driving wheels, a steam pressure of 180 lbs. and a total weight in working order of 260,000 lbs.

### CAR BUILDING.

THE SOUTHERN RAILWAY is said to be in the market for 500 hopper cars.

THE J. B. JENKINS COAL & COKE COMPANY, Elkins, W. Va., is considering the purchase of 400 fifty-ton hopper cars.

THE CHICAGO, BURLINGTON & QUINCY has ordered 500 fifty-ton gondola cars from the Haskell & Barker Car Company.

THE MISSOURI PACIFIC is in the market for 100 all steel passenger cars, including chair cars, coaches, baggage cars and express cars.

THE BUFFALO, ROCHESTER & PITTSBURGH is in the market for 1,000 forty-ton box cars, 1,000 fifty-ton gondola cars and 1,000 fifty-ton hopper cars.

THE CHICAGO & NORTH WESTERN has ordered 1,000 gondola cars from the Western Steel Car & Foundry Company and 1,000 gondola cars from the American Car & Foundry Company.

### IRON AND STEEL.

THE CHICAGO, BURLINGTON & QUINCY has ordered 25,000 tons of rails from the Illinois Steel Company.

THE ERIE RAILROAD has ordered 4,000 tons of titanium open hearth rails for severe curve service from the Carnegie Steel Company.

THE GREAT NORTHERN has ordered 20,000 tons of rails from the Illinois Steel Company, and 5,000 tons each from the Lackawanna Steel Company and the Bethlehem Steel Company.

NEW LINE FOR ECUADOR.—The Ecuadorian congress has just passed a law authorizing the construction of a railroad from Quito to the coast in the province of Esmeraldas, a distance of from 90 to 120 miles.

## Supply Trade News.

B. T. Lewis, western manager of the Railway Appliances Company, Chicago, died on October 11.

C. C. Whittier, manager of the Winnipeg, Man., office of the Robert W. Hunt Co., Ltd., Chicago, has been made treasurer and general manager of that company, with headquarters in Montreal, Que.

The Galena Signal Oil Company of Franklin, Pa., has bought about three acres of land at Clearing, Ill., on which to build steel storage tanks, a concrete and brick warehouse, and a power plant.

E. E. Hudson has been made fourth vice-president of Thomas A. Edison, Inc., Orange, N. J., with office at Orange. Mr. Hudson will continue as heretofore in charge of the sales of the Primary battery department.

Chester H. Jones has been placed in charge of the steam railroad department of the General Electric Company's new St. Louis district office. Mr. Jones has been connected with the steam railroad department in the Chicago territory.

Blake C. Howard, heretofore southwestern sales manager of B. W. Mudge & Co., has opened offices in the Railway Exchange building, St. Louis, Mo., to handle a general line of railway supplies. He will continue to represent B. W. Mudge & Co., together with other accounts.

The Canton Foundry & Machine Company, Canton, Ohio, has recently installed in the North Billerica, Mass., shops of the Boston & Maine, six portable cranes; and three portable cranes in the Scranton, Pa., shops of the Delaware, Lackawanna & Western. This company has also sold to the New York Central Lines one No. 4 Canton allegator shear; to the Boston & Albany, one No. 3 motor driven allegator shear; to the Chicago, Rock Island & Pacific, one No. 2 motor driven allegator shear; to the Elgin, Joliet & Eastern, two 8 ft. turntables for the Joliet, Ill., shops; and to the Central Railroad of New Jersey, thirteen 8-ft. turntables for the Elizabeth, N. J., shops.

## TRADE PUBLICATIONS.

**PNEUMATIC TOOLS.**—The Chicago Pneumatic Tool Company has issued bulletin 34-T, describing its class "M" Chicago Pneumatic Corliss type steam driven compressors.

**FIREPROOF FLOOR CONSTRUCTION.**—The Clinton Wire Cloth Company, Clinton, Mass., has issued a booklet of 34 pages, describing and illustrating a test conducted at the Columbia Fire Testing Station, Brooklyn, N. Y., on July 30, 1913, by Harold Perrine, of the University of Columbia, upon so-called fireproof floors, consisting of a floor slab of cinder concrete, one of terra cotta and one of gypsum and shavings. The test was a fire, load and water test for the purpose of comparing the fireproofing properties of the three different types. An average temperature of 1,700 deg. Fahr. was maintained for four hours against the under side of the slabs, which carried at the same time a load of 150 lbs. per sq. ft. At the end of four hours the under sides of the slabs, while hot, were subjected to water pressure of about 60 lbs. per sq. in. for five minutes through a standard fire nozzle  $1\frac{1}{2}$  in. in diameter. The top of the floor was then flooded at low pressure and the under surface of the slabs again subjected for five minutes to 60 lbs. pressure from the hose. On the following day after the floors had cooled they were then loaded with 600 lbs. per sq. ft., and the deflections were recorded. The concrete cinder and the gypsum slabs were reinforced with Clinton electrically welded wire. The cinder concrete floor went through the entire test practically uninjured and sustained a final loading of 600 lbs. per sq. ft. with a deflection of only  $\frac{9}{32}$  of an inch. The gypsum slab suffered a loss of all material below the reinforcement at the end of the water test and failed before the load of 600 lbs. was reached. The terra cotta floor showed a splitting and breaking of the lower webs of a number of the blocks when the water was applied and the destruction of their lower webs under the application of the load of 600 lbs. Full details of the test, together with photographs and diagrams are included in the pamphlet.

## Railway Construction.

**ALGOMA CENTRAL & HUDSON BAY.**—The section of the Algoma Eastern to Goat Island was opened for traffic on September 15, and the line is now being operated from Sudbury, Ont., to Goat Island, at which point a roundhouse and machine shop has been built. A bridge is under construction to connect Goat Island with Little Current, on Manitoulin Island, and it is expected will be ready for traffic about November 1. The passenger station and freight sheds will be located at Little Current. (July 18, p. 131.)

**ALGOMA EASTERN.**—See Algoma Central & Hudson Bay.

**BRITISH COLUMBIA ELECTRIC.**—This company is negotiating with the Great Northern for the purchase of the abandoned right of way of the Cloverdale-Blaine line between Hazelmerre and the International boundary at Blaine, Wash. The proposed line will connect with the line projected by the Stone & Webster Corporation, to Bellingham, Wash., and an extension may be built to the mouth of the Campbell river.

**CANADIAN PACIFIC.**—The Board of Railway Commissioners of Canada has approved the revised location plans on the Pacific division for the Kootenay Central, under construction by the Canadian Pacific, from mileage 37.35 southeasterly to mileage 57.19, and also approved the revised location plans of the Bassano easterly branch from mileage 98.72 to 115.59.

Preliminary work for the electrification of the Castlegar-Rossland section of the Canadian Pacific is under way. The power plant of the West Kootenay Power & Light Company is being increased to meet the Canadian Pacific requirements.

**CANADIAN ROADS.**—The city council of Winnipeg, Man., has passed a by-law providing for a water supply for the city from Shoal Lake at a cost of \$13,500,000. The report of the engineers on which the estimated cost is based contains \$1,020,000 to provide a standard gage railway from the point where the aqueduct leaves the Grand Trunk Pacific to Indian Bay, 85 miles, which is about \$12,000 a mile, for building such a line.

**CHICAGO, PEORIA & QUINCY TRACTION.**—An officer writes regarding the reports that this company will build a line to connect Quincy, Ill., with Peoria, that the company expects to start the work about April 1, 1914. J. L. Soebbing, president, Quincy, and the Chapman Company, Steger building, Chicago, is in charge of the engineering work.

**CHICAGO, ROCK ISLAND & PACIFIC.**—The report of this company for the year ended June 30, 1913, shows that the St. Paul & Kansas City Short Line between Carlisle, Iowa, and Allerton, Iowa, was opened for through passenger and freight train service on September 14, 1913. Construction of the Malvern & Camden from Malvern, Ark., to Camden, has been completed since the close of the fiscal year, and it was opened for operation on October 1, 1913. Industrial tracks were constructed to 77 private industries and to six coal mines, necessitating the construction of 83 tracks during the year, and additional track improvement was made, re-arranging and extending tracks to fifteen industries. During the year the company also completed work on additional and improved terminal facilities.

**COLORADO, WYOMING & NORTHERN.**—Incorporated in Colorado with \$5,000,000 capital, to build 100 miles of railroad from the Denver & Salt Lake near the confluence of the Elk and Bear rivers in Colorado north to a connection with the Union Pacific at Rawlins, Wyo. The directors include G. W. Bowen, W. J. Van Mannen, J. C. Buck, and O. L. Dines. The same interests will develop coal fields in Routt and Moffat counties, Colo. It is understood that financial arrangements have been made with Belgian capitalists to secure the necessary capital. The headquarters of the company will be in Denver, Colo., and in Toronto, Can.

**COOS BAY & COQUILLE VALLEY.**—An officer writes that grading work is now under way by Willet & Burr, San Francisco, Cal., from Myrtle Point, Oregon, following the south fork of Coquille river to Wagner Branch, 22 miles, and track has been laid on eight miles. The maximum grades will be  $1\frac{1}{10}$  per cent., and the maximum curvature 12 deg. There will be six Howe truss bridges, one tunnel, and three miles of trestles on the line.

The company expects to develop a traffic in logs, farm products and gravel. F. A. Haines, chief engineer of construction.

**DOMINION ATLANTIC.**—The Board of Railway Commissioners of Canada has approved of a revised location for the North Mountain branch between Grafton, N. S., and Torn Lake, in Cornwallis Township.

**EAST & WEST COAST.**—An officer writes that the prospects of building from Bradentown, Fla., to Arcadia, 52 miles, are good. Maximum grades will be one-half per cent.; maximum curvature one and one-half degrees. The company expects to develop a traffic in lumber, fruits, vegetables and phosphates. Allen W. Jones is president and general contractor, Bradentown.

**FLORIDA EAST COAST.**—An officer writes that grading work on the Kissimmee Valley division has been completed from Maytown, south to Kenanville, thence southeasterly via Apoxsee, Lokosee, Yeehaw, Osowaw, Focho and Hilolo, to Okeechobee, 123 miles. The section from Maytown to Kenanville, 72.5 miles is now in operation. In addition, grading work has been completed from Kenanville on a branch south to Bassenger, 36 miles. The work was carried out by the Kissimmee Valley Construction Company, Jacksonville, Fla., and involved handling about 3,000 cu. yds. to the mile, of which 10 per cent. was excavation work. The maximum grades are 4/10 of 1 per cent., and maximum curvature 3 deg. A 50-ft. Strauss bascule bridge was built over the St. Johns river, and there is an 800-ft. standard trestle over Ecoularkhatchee creek, and a 1,500-ft. standard trestle over St. Johns river, also a number of smaller structures varying in length from 10 to 60 ft. each. The company expects to develop a traffic in naval stores, manufactured lumber and citrus fruits. It is expected that track will be laid to Okeechobee, also on the branch to Bassenger during the early part of 1914.

**GULF, FLORIDA & ALABAMA.**—An officer writes that the 20-mile extension of the main line north of Local, Ala., will be accepted from the contractor before November 1, at which time the company expects to place the extension in operation. With this extension, the company will have in operation 106 miles. A contract for grading and additional 50 miles to a connection with the Southern Railway, near Pine Hill, Ala., has just been let to James T. McCarthy & Company, involving the handling of approximately 1,500,000 yds. of classified excavation. Under the terms of the contract the work must be completed in time for the extension to be opened by September 1, 1914. Plans are now being made for the necessary bridging to carry the line over the Alabama river near Yellow Bluff, which will consist of a draw span and the necessary truss approach spans, as well as some steel trestle. The total length of the bridge is to be about 2,500 ft. The company expects that both the sub-structure and superstructure contracts will be ready for bids about January 1, 1914. The company's forces are also engaged at a number of places on the existing line, in relocation of line and grade reduction to secure maximum grades of .75 per cent. southbound and 1 per cent. northbound, and extensive additions to the marine terminal at Pensacola are now under way. (October 10, p. 679.)

**ILLINOIS CENTRAL.**—This company has let a contract to J. D. Lynch, Monmouth, Ill., for grading on track depression work at Mattoon, Ill. The contract is worth about \$450,000.

**NIORARA WATER POWER RAILWAY.**—Incorporated in South Dakota with \$16,500,000 capital and headquarters at Omaha, Neb., and at Sioux City, Iowa. The company will secure power from the Niobrara river in Nebraska to operate electric railway lines in northeastern Nebraska, and to enter Iowa at Sioux City and South Dakota at Yankton, at which place a bridge is to be built over the Missouri river. An extension will be built on the south to Omaha. The lines in Nebraska will extend through the counties of Holt, Knox, Cedar, Dixon, Dakota, Thurston, Burt, Cuming, Antelope, Pierce, Madison, Stanton, Colfax, Dodge, Washington and Douglas. The incorporators are: C. W. Baker, Omaha, Neb.; O. S. Christian, Madison; H. P. Bruhman, Lehigh; P. Mangold, Bennington, and G. W. Martens, Pierre, S. Dak.

**NUECES VALLEY, RIO GRANDE & GULF.**—An officer writes that in addition to building from a point about a quarter of a mile east of Kitty, Tex., on the San Antonio, Uvalde & Gulf, to a point near the center of McMullen county, about 25 miles, the

company intends extending the line to connections with other lines, and developing a large section heretofore without rail facilities. The line as projected will follow the valley of the Nueces river most of the way. There will be some trestles on the line and a number of stations are to be put up. The principal commodities to be carried will be cattle and construction material. W. A. Matthaei, president, and J. W. Brooks, chief engineer, Belleville.

**PACIFIC & HUDSON BAY.**—A line is being surveyed, it is said, from Bella Coola, B. C., to Alexis creek, thence across the Cariboo river between mileage 103 and 105 to Beaver, B. C. E. Both, Bella Coola, B. C., is in charge of the surveys.

**ST. ELMO, BELLE HELENA & LOUISIANA EASTERN.**—An officer writes that this company has 11 miles of track laid in Louisiana and that the company expects early next year to build an extension about two miles long. In addition to the use of steam as the motive power, gasoline motor cars will be used. G. W. Reese, president, New Orleans, La.

**SAN ANTONIO & AUSTIN INTERURBAN.**—An officer is quoted as saying that construction work will soon be started on this line. About 40 per cent. of the right of way has been secured from Austin, Tex., southwest via Manchaca, Buda, Kyle, San Marcos, Hunter, and New Braunfels to San Antonio, about 85 miles. (March 28, p. 779.)

**SOUTH DAKOTA CENTRAL.**—This company, it is said, has under consideration the question of building an extension from Watertown, S. D., north into Day county, probably via Webster.

**SOUTHERN RAILWAY.**—The report of this company for the year ended June 30, 1913, shows that construction of the double-track line north of Atlanta, between Cross Keys and Gainesville, Ga. (exclusive of a single-track gauntlet between Suwanee and Duluth) was completed and put in operation during the year. Additional double-tracking was begun during the year between the following points: Amherst and Monroe, Va., New Holland and Gainesville, Ga., Cross Keys and Armour, Ga., and between Twenty-seventh street, Birmingham, and east end of yard at North Birmingham, Ala. With the completion of the double-track between Amherst and Monroe, and between New Holland and Gainesville, both of which are expected to be completed by the latter part of 1913, and that between Cross Keys and Armour, which is expected to be finished early in 1914, the company will have in operation on its main line between Washington and Atlanta 301.07 miles of double-track, or approximately 46 per cent. of the total mileage between those terminals. The track between Twenty-seventh street, Birmingham and the east end of yard at North Birmingham is expected to be in service about January 1, 1914. The additional main track between Constitution and Roseland, Ga., is now in operation. The new double-track connection with the Cincinnati, New Orleans & Texas Pacific at Citico Junction, Tenn., equipped with interlocking signals, was completed and put in service during the year. The Knoxville River Front Extension, also the belt line at High Point, N. C., were completed and put in service during the year. The lap-sidings between Macon and Jesup, Ga., the aggregate length of which is 19,028 ft., also a new gravity yard at Macon, Ga., were completed and put in service during the year. A new line from near Forbes, Va., on the Franklin branch, extending to ore properties, was completed during the year, and a revision of the main line for a distance of 3.3 miles in the vicinity of Parr Shoals, S. C., was made necessary by the construction, by a power company, of a dam in Broad river.

**SOUTHWESTERN TRACTION & POWER COMPANY.**—We are told that this company, operating 13 miles of electric line between New Iberia, La., and Jeanerette, has not yet decided when contracts will be let to complete the through line projected several months ago from Berwick northwest to St. Martinsville, about 75 miles. The plans call for putting up a power house and several sub-stations. (July 25, p. 170.)

**TRI-STATE RAILWAYS COMPANY OF MICHIGAN.**—An officer writes that this company has been incorporated in Michigan to build an interurban line from Adrian, Mich., in Lenawee county, southwest to Elkhart, Ind., with a branch from this line at Manataw beach on Devil's lake in Lenawee county north to Jackson in Jackson county. Some of the right of way has been secured and the prospects for building are good. The company expects to develop a traffic in dairy products, general agricultural prod-

ucts, live stock, lumber, etc. Harry McClave, president, Hillsdale, Mich.

**TRONA RAILWAY.**—An officer writes that grading work is now under way and is being carried out by Robert Sherer & Company, Los Angeles, Cal., on the line from Searles, Cal., on the Southern Pacific, in Kern county, northerly and northeasterly to Searles Lake, in the northwest corner of San Bernardino county, 31 miles. Maximum grades will be 1.75 per cent. compensated and maximum curvature 2 degrees. W. A. Cattell, chief engineer, San Francisco, Cal. (May 16, p. 1115.)

#### RAILWAY STRUCTURES.

**BALTIMORE, Md.**—The Baltimore & Ohio will make a large addition to its freight facilities in the Camden station terminal at Baltimore. The plans call for the construction of an out-bound freight house to be 600 ft. long x 20 ft. wide, with four tracks having a capacity of 15 cars each and a platform 8 ft. wide, to be built along Eutaw street, between Lee and Cross streets. The terminal will be built by the railroad forces.

**BATHURST, N. B.**—See Truro, N. S.

**MEMPHIS, TENN.**—The report of the Chicago, Rock Island & Pacific for the year ended June 30, 1913, shows that the Arkansas & Memphis Railway Bridge & Terminal Company was incorporated to build a double track steel bridge across the Mississippi river at Memphis, Tenn. Construction is now under way and this bridge when completed will be equally owned by The Chicago, Rock Island & Pacific, the St. Louis, Iron Mountain & Southern and the St. Louis Southwestern.

**NONCONNAH, TENN.**—The Illinois Central has given a contract to Swift & Co., Chicago, for building a new roundhouse at Nonconnaah.

**OIL CITY, PA.**—An officer of the Pennsylvania writes that the erection of a bridge to replace the present structure is contemplated at Oil City, Pa., but definite plans have not as yet been decided upon.

**PENSACOLA, FLA.**—Extensive improvements to the marine terminal of the Gulf, Florida & Alabama are now under way, comprising the dredging, to 31 ft. of depth, of a channel, turning basin and slips for two piers, in addition to the one now in operation, the dredged material being deposited behind a bulkhead, thereby reclaiming thirty acres of land which is to be used for yard and warehouse purposes. The contract for the dredging has been let to the Atlantic, Gulf & Pacific Company, New York. Plans are now being made for a modern coaling dock, on which bids will be asked in time to insure its completion by September, 1914. The additional docks are being built by the company's forces, although contract will shortly be let for the steel frame for a pier shed 100 ft. wide x 1,200 ft. long. See Gulf, Florida & Alabama under Railway Construction.

**ST. CESAIRE, QUE.**—The Montreal & Southern Counties has given a contract to John Ross, of Ross & McComb, it is said, for the concrete sub-structure of a bridge to be built over the Yamaska river at St. Cesaire. The bridge will have four piers and two abutments. It is understood that the Dominion Bridge Company will erect the superstructure.

**ST. MALO, QUE.**—The National Transcontinental has given a contract to J. Gosselin, Levis, Que., it is said, for putting up machine and other shop buildings at St. Malo.

**TRURO, N. S.**—New station buildings are to be erected at Truro, N. S., and at Bathurst, N. B., by the Intercolonial Railway. It is also proposed to overhaul many of the other station buildings on the road.

**VAN BUREN, MAINE.**—The International St. John River Commission having given its formal consent and approved of the project to build an international railroad bridge between Van Buren, Me., and St. Leonards, N. B., the last legal obstacle in the path of the promoters has been removed. Van Buren is one of the terminal points of the Bangor & Aroostook, and St. Leonards is the junction point of three Canadian roads, the Intercolonial, Canadian Pacific and the Grand Trunk Pacific. It is understood that plans are being made for the construction of a link connecting these lines. (May 9, p. 1053.)

## Railway Financial News.

**BOSTON & MAINE.**—See New York, New Haven & Hartford.

**CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.**—The Public Utilities Commission of Ohio has authorized the company to issue \$1,578,000 general mortgage bonds, to be sold at not less than 90; and, as has already been noted in these columns, has further modified its order permitting the issue of \$1,000,000 of these bonds at 90 and \$578,000 of these bonds at 81; the \$1,000,000 bonds having, of course, already been sold at 90.

**DELAWARE & HUDSON.**—This company has received permission from the New York Public Service Commission, Second district, to issue \$4,500,000 first and refunding mortgage 4 per cent. bonds of 1908-1943. The bonds are to be sold at not less than 95. The company had asked for authority to issue \$5,000,000 of these bonds, of which \$3,000,000 were to retire a like amount of bills payable incurred for expenditures for additions and betterments, and \$2,000,000 were to be used to pay for future additions and betterments.

**MEMPHIS UNION STATION.**—Potter, Choate & Prentice, New York, are offering \$2,500,000 first mortgage 5 per cent. bonds of November 1, 1913-1959 at 101 $\frac{3}{4}$ , to yield 4.90 per cent. on the investment. The bonds are guaranteed jointly and severally, principal and interest, by the Louisville & Nashville; Nashville, Chattanooga & St. Louis; St. Louis, Iron Mountain & Southern; Southern Railway, and St. Louis Southwestern.

**NEW YORK, NEW HAVEN & HARTFORD.**—The Massachusetts Railroad Commission has finally authorized the company to issue its \$67,552,000 6 per cent. debenture bonds. These bonds are offered to stockholders at par and are convertible after October 1, 1918, and not later than October 1, 1928, into stock at par.

Theodore N. Vail and Alexander Cochrane, both directors of the Boston & Maine, have resigned as directors of the New York, New Haven & Hartford.

**NORFOLK SOUTHERN.**—At the annual meeting the by-laws were changed providing for 19 directors instead of 17. Lewis L. Clarke, president of the American Exchange National Bank, was elected a director and the other vacancy was not filled.

**UNION PACIFIC.**—After the meeting of the board of directors on Thursday of last week Judge Lovett gave out the following statement:

"The question of the disposition to be made of the large cash fund realized by the Union Pacific from the proceeds of the recent sale of Southern Pacific stock, and possibly of certain other assets of the company, has received the urgent and careful attention of the board of directors. The conclusion has been arrived at that existing circumstances make it inexpedient to deal with this subject at present. To avoid misunderstanding, however, it is deemed right to state that none of the various plans which have thus far been considered and discussed contemplated any division of surplus either in cash or securities which in its result would have increased the present yield of the stock."

Judge Lovett was prevailed upon by the *Wall Street Journal* to amplify the last paragraph of his statement. He said: "Personally I see no necessity for any amplification, but to remove any misunderstanding, I may say simply that Union Pacific is a 10 per cent. stock, paying 10 per cent. out of investment income and transportation earnings. It was the purpose of the directors to conserve to the Union Pacific investor that same income. All of the plans considered for an extra dividend provided for a corresponding reduction in the 10 per cent. rate paid on the Union Pacific common stock."

**BOLIVIAN RAILWAY DEVELOPMENT.**—Railway development in Bolivia continues, and the lack of transportation facilities is being gradually lessened. Although on the Pacific side the republic is fairly provided with communications by means of the Antofagasta, the Arica to La Paz, and the La Paz to Huaqui Railways (the latter connecting via Lake Titicaca with the Peruvian port of Mollendo), the Atlantic side is only served by the rivers assisted by the Madeira & Mamoré Railway.

## ANNUAL REPORTS.

## SOUTHERN RAILWAY—NINETEENTH ANNUAL REPORT.

WASHINGTON, D. C., October 3, 1913.

To the Stockholders of the Southern Railway Company:

The Board of Directors submits the following report of the affairs of the Company for the year ended June 30, 1913:

## INCOME STATEMENT.

	1913.	1912.	Increase or Decrease.
Miles of Road Operated, Average .....	7,035.61	7,088.03	Dec. 52.42
Gross Operating Revenues... \$68,529,490.20	\$63,590,328.90	Inc. \$4,939,161.30	
Total Operating Expenses... 48,273,923.55	43,696,236.39	Inc. 4,577,687.16	
Net Operating Revenue..... \$20,255,566.65	\$19,894,092.51	Inc. \$361,474.14	
Auxiliary Operations—Net Revenue .....	80,535.87	64,754.67	Inc. 15,781.20
Net Revenue .....	\$20,336,102.52	\$19,958,847.18	Inc. \$377,255.34
Taxes .....	2,480,387.28	2,452,328.28	Inc. 28,059.00
Operating Income .....	\$17,855,715.24	\$17,506,518.90	Inc. \$349,196.34
Other Income .....	3,365,970.50	3,580,441.70	Dec. 214,471.20
Total Gross Income.... \$21,221,685.74	\$21,086,960.60	Inc. \$134,725.14	
Deductions from Income.... 3,104,086.17	3,180,139.70	Dec. 76,053.53	
Total Available Income.. \$18,117,599.57	\$17,906,820.90	Inc. \$210,778.67	
Interest on Mortgage, Bonded and Secured Debt..... 11,038,974.40	11,143,703.84	Dec. 104,729.44	
Balance of Income over Charges .....	\$7,078,625.17	\$6,763,117.06	Inc. \$315,508.11
Dividends on Preferred Stock:			
No. 23, Two Per Cent., paid in April, 1912; No. 25, Two and One-Half Per Cent., paid in April, 1913. \$1,500,000.00	\$1,200,000.00	Inc. \$300,000.00	
No. 24, Two and One-Half Per Cent., paid in October, 1912; Reserve for Dividend No. 26, Two and One-Half Per Cent., payable in October, 1913. 1,500,000.00	1,500,000.00		
Total Dividends .....	\$3,000,000.00	\$2,700,000.00	Inc. \$300,000.00
Balance over Dividends on Preferred Stock .....	\$4,078,625.17	\$4,063,117.06	Inc. \$15,508.11
Additions and Betterments... 48,660.48	44,989.42	Inc. 3,671.06	
Balance carried to Credit of Profit and Loss... \$4,029,964.69	\$4,018,127.64	Inc. \$11,837.05	

## PROFIT AND LOSS.

The surplus shown by the Profit and Loss statement as of June 30, 1912, was \$13,756,936.13. After making provision through Income for the full Dividend on the Preferred Stock, amounting to \$3,000,000, and charging to Profit and Loss \$98,332.96, Discount on Securities, thus extinguishing the entire amount of such discount, and \$314,009.66, representing net miscellaneous accounts written down, the surplus as of June 30, 1913, amounted to \$17,374,558.20, a gain of \$3,617,622.07 over the preceding year.

## DISCOUNT ON SECURITIES.

The Discount on Equipment Trust Obligations and other securities sold by the Company during the year amounted to \$110,350.00, of which \$12,017.04 was charged to Income and the balance, \$98,332.96, to Profit and Loss.

## INTEREST.

The accrued interest on Mortgage, Bonded and Secured Debt for the year ended June 30, 1913, was \$104,729.44 less than for the preceding year. The interest on Equipment Trust Obligations decreased \$5,604.43 and on Bonds and Notes \$99,125.01, due principally to the retirement at maturity February 1, 1913, of \$5,000,000 of the Company's Three-Year Five Per Cent. Notes.

## DIVIDENDS.

A dividend of Two and One-Half Per Cent. on the Preferred Stock of the Company was paid April 24, 1913, and provision has been made for the payment on October 30, 1913, of a dividend of Two and One-Half Per Cent. declared out of Income earned during the year.

## PROPERTY INVESTMENT AND MORTGAGE DEBT.

The investment in physical property, exclusive of depreciation, increased \$3,516,514.27, of which \$2,927,739.04 was in Roadway and Structures and \$588,775.23 in Equipment. This increase represents net additions made during the year. (See pages 24 and 25.)

During the year there was a decrease of \$3,628,600 in outstanding Mortgage and Collateral Trust Bonds and Notes and \$1,234,000 in Equipment Trust Obligations. (See page 28.)

The \$10,000,000 Three-Year Five Per Cent. Notes issued in 1910, were retired by the payment at maturity, February 1, 1913, of \$5,000,000 in cash out of Treasury funds, and with the proceeds from the sale of \$5,000,000 Three-Year Five Per Cent. Notes dated February 1, 1913.

There were paid at maturity, April 10, 1913, \$150,000 Atlantic, Tennessee and Ohio Railroad Company First Mortgage Six Per Cent. Bonds, and a like amount of Southern Railway Company First Consolidated

Mortgage Five Per Cent. Bonds were drawn therefor as provided in the mortgage.

On June 4, 1913, there were sold \$1,500,000 Southern Railway Company First Consolidated Mortgage Five Per Cent. Bonds, therefore free in the Treasury, to reimburse the Treasury, in part, for expenditures incident to additions and betterments.

There were retired during the year, through the sinking fund provisions of the mortgages, \$30,600 Charlottesville and Rapidan Railroad Company First Mortgage Six Per Cent. Bonds and \$6,000 Franklin and Pittsylvania Railroad Company First Mortgage Six Per Cent. Bonds. \$37,000 First Consolidated Mortgage Five Per Cent. Bonds were drawn on account thereof and placed in the Treasury.

By reason of these and previous drawings for similar purposes, and the sale of \$1,500,000 Southern Railway Company First Consolidated Mortgage Five Per Cent. Bonds, there remained free in the Treasury on June 30, 1913, \$1,114,800 of these bonds.

During the month of June, 1913, there were drawn and taken into the Treasury \$5,000,000 Development and General Mortgage Four Per Cent. Bonds, which, under the terms of that mortgage could be drawn during the calendar year 1913 to reimburse the Company for expenditures made for additions and betterments. In like manner there were also drawn and taken into the Treasury during the year \$1,130,000 of these Bonds to reimburse the Company for proportion of Equipment Trust Obligations paid during the year and charged to capital account.

As the result of these drawings, the total amount of Development and General Mortgage Four Per Cent. Bonds free in the Treasury on June 30, 1913, was \$25,992,000.

The Company has continued the conservation of its Working Assets through the employment of its Treasury funds.

## ADDITIONS AND BETTERMENTS.

Construction of the double-track line north of Atlanta, between Cross Keys and Gainesville, Ga. (exclusive of a single-track gauntlet between Suwanee and Duluth) referred to in last year's report, was completed and put in operation during the year.

Additional double-tracking was begun during the year between the following points: Amherst and Monroe, Va., New Holland and Gainesville, Ga., Cross Keys and Armour, Ga., and between 27th Street, Birmingham, and east end of yard at North Birmingham, Ala.

With the completion of the double-track between Amherst and Monroe, and that between New Holland and Gainesville, both of which pieces are expected to be completed by the latter part of 1913, and that between Cross Keys and Armour, which is expected to be finished early in 1914, the Company will have in operation on its main line between Washington and Atlanta 301.07 miles of double-track, or approximately 46 per cent. of the total mileage between those terminals. The track between 27th Street, Birmingham and the east end of yard at North Birmingham is expected to be in service about January 1, 1914.

The additional main track between Constitution and Roseland, Ga., referred to in last year's report, is now in operation.

The new double-track connection with the Cincinnati, New Orleans & Texas Pacific Railway at Citico Junction, Tenn., equipped with interlocking signals, referred to in report for the preceding year, was completed and put in service during the year.

The Knoxville River Front Extension, referred to in last year's report, was completed during the year and the entire line is now in operation.

The belt line at High Point, N. C., referred to in last year's report, was completed and put in service during the year.

The lap-sidings between Macon and Jesup, Ga., the aggregate length of which is 19,028 feet, referred to in last year's report, were completed and put in service during the year.

A new gravity yard at Macon, Ga., was completed and put in service during the year.

A new line from near Forbes, Va., on the Franklin Branch, extending to ore properties, was completed during the year.

A revision of the main line for a distance of 3.3 miles in the vicinity of Parr Shoals, S. C., was made necessary by the construction, by a power company, of a dam in Broad River. The expense of this work is to be borne by the power company.

The new passenger station at Lynchburg, Va., the building of which was made necessary by the new double-track line at that point, was put in service October 31, 1912.

The installation of electrical automatic signal system between Denim and Charlotte, N. C., a distance of approximately 96 miles, was completed and placed in operation during the year, and a similar system is under construction between Cameron Run and Orange, Va., a distance of approximately 75 miles.

During the year the Company received the following new and additional equipment: 45 locomotives, 20 steel frame passenger coaches, 10 steel baggage, mail and express cars, 6 steel frame dining cars, 275 steel underframe ventilated box cars, 150 steel underframe automobile box cars, 104 steel flat cars and 4 pieces of road service equipment. It had in course of conversion during the year 600 coal cars, the bodies of which had passed the stage of economical operation, into steel underframe ventilated box cars, of which 551 were completed and placed in service during the year.

Since the close of the year the Company has contracted for the following additional equipment: 25 locomotives, 1,720 fifty-ton steel coal cars and 150 thirty-ton steel underframe stock cars.

## OPERATIONS.

Gross Revenues increased over those of the preceding year \$4,993,161.30. Operating Expenses increased \$4,577,687.16, of which increase 57.14 per cent., or more than one-half, was in maintenance of the property, 33.28 per cent. in transportation, 7.62 per cent. in the development of traffic and 1.96 per cent. in administration expenses. Approximately 37.68 per cent. of the increase in the cost of transportation was due to higher wage schedules.

## Freight Traffic:

Freight revenues increased over those of the preceding year \$3,435,447.44. The growth in production and in the consuming energy of the territory served by the Company's lines is reflected in its classified tonnage statistics. These statistics reveal increased tonnage in a period of ten years as follows:

Products of Agriculture.....	1,037,699 tons, or 42.1 per cent.
Products of Animals.....	53,689 tons, or 19.9 per cent.
Products of Mines.....	3,528,532 tons, or 42.8 per cent.
Products of Forest.....	1,921,428 tons, or 62.4 per cent.
Manufactures and Miscellaneous...	3,710,757 tons, or 72.3 per cent.

Total Increase ..... 10,252,105 tons, or 53.4 per cent.

Production in excess of local need creates tonnage for distant markets, and the increase in the tonnage of the products of the soil, forest and factory illustrates a remarkable expansion in the distribution of the products of the section the Company serves.

The production of grain in the Southeast has increased largely in recent years, but in the section as a whole the production is not yet in excess of the local demand although with the more general adoption of diversified farming the tendency is strongly in that direction.

The volume of other agricultural products is steadily increasing and the Southeast is supplying other sections of the country in larger measure each year with its fruits and vegetables.

The expansion of industrial enterprise keeps well abreast with the progress of the country at large, and there is a steady increase in tonnage of the products of mines and forest and of manufactures.

#### Passenger Traffic:

The passenger traffic of the Company has shown a gratifying increase during the year, the increase in revenues therefrom being \$1,280,678.07. An important factor in bringing this about is the geographical location of the system with reference to the currents of commercial travel and to the summer and winter tourist resorts of the Southeast. Reaching most of the principal commercial centers of the section the Company's lines are favorably located for travel within the territory and between it and other sections of the United States. Increasing numbers of conventions, re-unions, religious assemblies and similar gatherings are being held at points on the Company's lines, and in connection with the religious assemblies there is in progress a noteworthy development of community life in the summer resort regions in the mountainous territory served by the Company, resulting in a substantial increase in travel over its lines.

Details of operations of the Company are set forth in the report of the Vice-President and General Manager, hereto annexed.

#### RELATIONS OF THE COMPANY TO THE PROGRESS OF THE SOUTH.

During the year the Company has continued and still further expanded its broad work in aid of agricultural and industrial development in the territory traversed by its lines.

#### Agriculture:

The rate at which agricultural development is adding to the wealth of the nine Southeastern States traversed by the Company's lines is indicated by United States Census figures showing that the value of farm property increased from \$2,189,114,320 in 1900 to \$4,461,411,250 in 1910, an increase of \$2,272,296,930, or 103.8 per cent., a much higher percentage of increase than is shown for any other group of older states. During the decade covered by the Census the total annual value of all farm crops produced in those states increased from \$593,843,573 to \$1,199,424,319, an increase of \$605,580,746, or 102 per cent., which is also a more rapid rate of increase than is shown by any other group of older states.

The most marked tendency of agricultural progress in the Southeast is in the direction of wider diversification and increased attention to live stock. At the same time the production of distinctively Southern crops is being maintained and increased. This may be strikingly illustrated by statistics of cotton and corn. Cotton production in the States traversed by the Company's lines increased from 4,967,490 bales in 1900 to 6,876,023 bales in 1912, an increase of 1,908,533 bales, or 38.4 per cent. While cotton production was thus being more than maintained, the corn crop was increased from 290,231,843 bushels in 1900 to 504,135,000 bushels in 1912, an increase of 213,903,157 bushels, or 73.7 per cent.

The Company's Department of Farm Improvement Work is continuing to be an effective factor in bringing about increased agricultural production in the territory along its lines. On farms where its advice has been followed crop yields per acre have been substantially larger than on similar lands in the same localities where this advice has not been followed. This may be illustrated by a case in which a farmer followed the advice of the Department on part of a field from which he harvested 35 bushels of wheat as compared with 10½ bushels on the remainder of the same field which was farmed in accordance with his old methods. A preliminary report of the Manager of this Department for the current year shows that its Field Agents were actively co-operating with 2,374 farmers and that 62,090 acres were being cultivated under their personal instructions. The scope of the Department's work is much broader than indicated by these figures, as many farmers not working under personal instructions are following the advice of the Department and as the Manager, Assistant Managers, and Field Agents deliver addresses at meetings of farmers, attend large numbers of farmers' meetings and hold neighborhood meetings in the fields where practical demonstrations of improved methods are given.

The Mexican cotton boll weevil, having spread into territory along the lines of the Company and its Associated Companies in Mississippi and in Western Alabama, special efforts have been made by the Department of Farm Improvement Work, in co-operation with the United States Department of Agriculture, state authorities and local merchants and bankers, to aid the farmers in controlling this insect. These efforts have been so highly successful as greatly to reduce the damage done by the weevil. The results attained have been such as to demonstrate the wisdom of the Company in undertaking, in advance of the appearance of the weevil, to instruct farmers as to its control. There is no other region into which this insect has spread since its first appearance in Texas in which the damage in the first year of its general prevalence has been so small as in the territory along the Company's lines.

The live stock and dairy industries in the territory traversed by the Company's lines have continued to receive helpful attention during the year. Through the operation of a dairy instruction car and through visiting dairymen and farmers, demonstrating the best methods of handling milk and making butter and giving advice as to the selection and management of dairy herds and as to the management of poultry, a substantial development of the dairy and poultry industries along the Company's lines is being brought about. The attention given to the live stock business has resulted in increased movements of cattle to the various feeding grounds along the Company's lines and of butchers stock to market.

#### Marketing Agricultural and Horticultural Products:

Successful marketing being essential to profitable production, the Company and its Associated Companies on January 1, 1913, appointed four Market Agents to co-operate with producers and buyers for the successful marketing of agricultural and horticultural products from the territory adjacent to their lines. These agents neither buy nor sell, but it is their function to advise producers as to market opportunities and as to best methods of packing and shipping and to advise buyers as to where different varieties of products may be obtained. The services of these Agents are being availed of with substantial results.

#### Farm Settlers:

The Land and Industrial Department of the Company has continued and broadened its solicitation of farm settlers. The advantages which the

Southeast has to offer in climate and in lands that are relatively cheap in proportion to their productive value and the accessibility of markets are being more widely appreciated. The abundance of land available is indicated by the United States Census figures showing that, with a total land area of 264,058,880 acres, the nine Southeastern States had 169,174,373 acres, or 64 per cent. in farms, and the Census Bureau classes 82,831,384 acres or 48.9 per cent. of the land in farms, or 31.4 per cent. of the total land area, as "improved land in farms." The agricultural resources of the territory are such that it offers an attractive field for the farm settler from the more congested parts of the United States or for the men who have found conditions disappointing in other localities. The result is that there is an increasing movement of farm settlers into the territory along the Company's lines.

#### Manufacturing:

The advantages of the territory along the Company's lines for diversified manufacturing have led to continued development during the year. Special attention is being given to the location of industries which use as their raw materials the products of primary manufacturing and to attracting to the Southeast industries which have not heretofore been largely developed in that section.

The number of new industrial plants completed during the fiscal year at points on the Company's lines was 523, classified as follows:

Brick Works .....	37
Cotton Seed Oil Mills.....	20
Fertilizer Works .....	11
Flour and Feed Mills.....	26
Furniture Factories .....	14
Iron Industries .....	24
Lumber Mills .....	93
Stone Quarries, Coal and Other Mines.....	44
Tanneries .....	2
Textile Mills .....	37
Woodworking Plants .....	46
Miscellaneous .....	169
Total .....	523

The number of industrial plants under construction at the close of the year was 60, and the number of plants to which additions were made during the year was 222.

#### SERVICE OF EMPLOYEES.

It is a source of much pleasure to the Board to renew its expression of appreciation of the loyal and efficient service rendered during the year by officers and employees in all departments of the Company in the performance of their duties.

#### ACCOUNTS AND STATISTICS.

Statements of the accounts and statistics of the Company in the usual detail will be found in the tables hereto annexed.

The accounts have been examined, as usual, by Certified Public Accountants, Messrs. Patterson, Teale & Dennis, and their certificate is made a part of this report.

Respectfully submitted, by order of the Board,

W. W. FINLEY,  
President.

TABLE 1.  
INCOME STATEMENT FOR YEAR ENDED JUNE 30, 1913, COMPARED WITH YEAR ENDED JUNE 30, 1912.

1912.		1913.
	<b>OPERATING REVENUES:</b>	
\$41,508,300.38	Freight Revenue .....	\$44,943,747.82
16,939,811.36	Passenger Revenue .....	18,220,489.43
326,202.88	Miscellaneous Passenger-Train Revenue...	330,547.81
1,352,298.62	Mail Revenue .....	1,379,165.00
1,948,956.80	Express Revenue .....	2,008,008.99
876,357.79	Other Transportation Revenue.....	924,656.90
	Revenue from Operations other than Transportation .....	722,874.25
638,401.07		
\$63,590,328.90	<b>TOTAL OPERATING REVENUES.....</b>	\$68,529,490.20
	<b>OPERATING EXPENSES:</b>	
\$7,841,220.15	Maintenance of Way and Structures.....	\$9,275,553.17
10,108,672.84	Maintenance of Equipment .....	11,290,337.19
1,745,353.05	Traffic Expenses .....	2,094,009.69
22,081,653.47	Transportation Expenses .....	23,605,046.02
1,919,336.88	General Expenses .....	2,008,977.48
\$43,696,236.39	<b>TOTAL OPERATING EXPENSES.....</b>	\$48,273,923.55
\$19,894,092.51	<b>NET OPERATING REVENUE .....</b>	\$20,255,566.65
64,754.67	<b>AUXILIARY OPERATIONS—NET REVENUE.....</b>	80,535.87
\$19,958,847.18	<b>NET REVENUE .....</b>	\$20,336,102.52
2,452,328.28	<b>TAXES .....</b>	2,480,387.28
\$17,506,518.90	<b>OPERATING INCOME .....</b>	\$17,855,715.24
	<b>OTHER INCOME:</b>	
\$20,000.00	Rents from Lease of Roads.....	\$65,000.00
31,206.88	Hire of Equipment—Balance.....	5,072.83
208,394.38	Joint Facility Rent.....	210,696.09
112,517.35	Miscellaneous Rent .....	108,095.03
28,373.37	Net Income from Rail Leased.....	27,396.19

1912.		1913.	1912.		1913.
1,357,142.71	Dividends on Stocks.....	1,318,235.55		INTEREST ACCRUED ON FUNDED DEBT (See Table 2) .....	\$10,105,356.65
1,401,290.08	Interest on Bonds and Notes.....	1,390,490.35	\$10,204,481.66	INTEREST ACCRUED ON EQUIPMENT OBLIGATIONS (See Table 2).....	706,809.75
268,376.83	Interest on Unfunded Securities and Accounts .....	214,434.38	712,414.18	DIVIDENDS ACCRUED ON SOUTHERN RAILWAY—MOBILE AND OHIO STOCK TRUST CERTIFICATES .....	226,808.00
153,140.10	Miscellaneous Income .....	26,550.08			
\$3,580,441.70	TOTAL OTHER INCOME.....	\$3,365,970.50	226,808.00		
\$21,086,960.60	TOTAL GROSS INCOME.....	\$21,221,685.74	\$11,143,703.84		\$11,038,974.40
	DEDUCTIONS FROM TOTAL GROSS INCOME:			BALANCE OF INCOME OVER CHARGES.....	\$7,078,625.17
	Income from Operation, Southern Railway Company in Mississippi, Alabama State Line to Columbus, Miss.....	\$48,213.72	\$6,763,117.06	FROM WHICH DEDUCT DIVIDENDS ON PREFERRED STOCK:	
\$50,950.88	Rents for Lease of Other Roads (See Table 2) .....	1,783,327.58	\$1,200,000.00	Nos. 23 (2%) and 25 (2½%) paid in April	\$1,500,000.00
1,865,927.33	Joint Facility Rent.....	969,219.82		No. 24 (2½%) paid in October, 1912, and Reserve for Dividend No. 26 (2½%), payable in October, 1913.....	1,500,000.00
898,444.10	Miscellaneous Rent .....	35,920.74	1,500,000.00	TOTAL DIVIDENDS .....	\$3,000,000.00
36,242.83	Separately Operated Properties.....	167,633.10	\$2,700,000.00	BALANCE OVER DIVIDENDS ON PREFERRED STOCK	\$4,078,625.17
180,701.01	Amortization of Discount on Funded Debt.....	12,017.04		APPROPRIATION OF INCOME FOR ADDITIONS AND BETTERMENTS .....	48,660.48
60,043.25	Interest on Unfunded Debt.....	244.56	\$4,063,117.06	BALANCE CARRIED TO CREDIT OF PROFIT AND LOSS .....	\$4,029,964.69
366.84	Miscellaneous Deductions .....	87,509.61	44,989.42		
87,463.46	TOTAL DEDUCTIONS .....	\$3,104,086.17			
\$3,180,139.70	TOTAL AVAILABLE INCOME.....	\$18,117,599.57	\$4,018,127.64		
\$17,906,820.90					

TABLE 4.  
GENERAL BALANCE SHEET, JUNE 30, 1913, AND JUNE 30, 1912.

JUNE 30, 1912.	ASSETS.	JUNE 30, 1913.
	PROPERTY INVESTMENT:	
	ROAD AND EQUIPMENT:	
	Investment to June 30, 1907:	
\$287,434,900.33	Road .....	\$287,434,900.33
46,672,108.87	Equipment (Including Trust Equipment).....	46,672,108.87
\$334,107,009.20	Total Investment to June 30, 1907.....	\$334,107,009.20
	Investment since June 30, 1907:	
\$17,600,330.82	Road .....	\$20,528,069.86
18,241,339.68	Equipment (Including Trust Equipment).....	18,830,114.91
35,841,670.50	Total Investment since June 30, 1907.....	\$39,358,184.77
\$369,948,679.70	Total Road and Equipment.....	\$373,465,193.97
13,480,904.46	Less: Reserve for Accrued Depreciation on Equipment.....	14,321,746.67
\$356,467,775.24	Total Net Road and Equipment.....	\$359,143,447.30
	SECURITIES:	
	Securities of Proprietary, Affiliated and Controlled Companies, Pledged:	
\$2,487,686.26	Stocks .....	\$2,487,586.26
21,508,920.74	Bonds .....	21,508,920.74
\$23,996,607.00		\$23,996,507.00
2,000,000.00	Bonds Issued or Assumed, Pledged.....	2,000,000.00
	Securities of Proprietary, Affiliated and Controlled Companies, Unpledged:	
\$116,887.21	Stocks .....	\$116,887.21
684,418.75	Bonds .....	678,418.75
801,305.96		795,305.96
\$26,797,912.96	Total .....	\$26,791,812.96
	OTHER INVESTMENTS:	
\$419,193.34	Advances to Proprietary, Affiliated and Controlled Companies for Construction, Equipment and Betterments.....	\$408,234.86
	MISCELLANEOUS INVESTMENTS:	
\$355,590.67	Physical Property .....	\$401,844.24
33,588,943.91	Securities, Pledged .....	33,640,943.91
9,450,980.28	Securities, Unpledged .....	9,283,027.94
43,395,514.86		43,325,816.09
\$43,814,708.20	Total .....	\$43,734,050.95
	WORKING ASSETS:	
\$113,048,782.30	Cash .....	\$8,295,928.23
22,331,800.00	Securities Issued or Assumed, Held in Treasury.....	27,148,800.00
	Marketable Securities:	
\$256,522.00	Stocks .....	\$256,522.00
179,059.04	Bonds .....	179,060.04
51,455.00	Miscellaneous .....	
487,036.04	Loans and Bills Receivable.....	435,582.04
448,483.55	Traffic and Car Service Balances due from other Companies.....	398,402.85
762,026.42	Balance due from Agents and Conductors.....	826,707.66
467,025.40	Miscellaneous Accounts Receivable.....	449,968.74
2,237,325.52	Material and Supplies (See Table 11).....	2,932,361.60
4,210,084.90	Other Working Assets.....	5,343,032.61
722,674.10		774,248.79
\$44,715,238.23	Total .....	\$46,605,032.52
\$1,062,490.26	ACCRUED INCOME NOT DUE:	
	Unmatured Interest, Dividends and Rents Receivable.....	\$962,243.79
	DEFERRED DEBIT ITEMS:	
\$730,882.15	Temporary advances to Proprietary, Affiliated and Controlled Companies.....	\$695,737.86
136,428.19	Working Funds .....	255,034.61
1,063,764.13	Other Advances .....	986,782.28
2,046.61	Insurance Premiums Paid in Advance.....	1,486.68
29,150.03	Taxes Paid in Advance.....	29,089.11
2,923,331.19	Special Deposits .....	2,718,164.33
3,525.00	Cash and Securities in Sinking and Redemption Funds.....	39,298.80
915,941.37	Cash and Securities in Insurance Reserve Fund.....	989,354.41
1,377,926.99	Other Deferred Debit Items.....	1,432,770.97
7,182,995.66	Total .....	7,147,719.05
\$480,041,120.55	GRAND TOTAL .....	\$484,384,306.57

JUNE 30, 1912.		LIABILITIES.		JUNE 30, 1913.	
<b>CAPITAL STOCK:</b>					
\$120,000,000.00	Common .....			\$120,000,000.00	
60,000,000.00	Preferred .....			60,000,000.00	
	<b>Total .....</b>				<b>\$180,000,000.00</b>
<b>MORTGAGE, BONDED AND SECURED DEBT:</b>					
\$193,956,900.00	Mortgage Bonds, Outstanding .....	\$195,276,300.00			
24,539,800.00	Mortgage Bonds, Held by Company .....	29,356,800.00			
	<b>Total .....</b>				<b>\$224,633,100.00</b>
\$19,738,700.00	Collateral Trust Bonds, Outstanding .....	\$19,790,700.00			
42,000.00	Collateral Trust Bonds, Held by Company .....	42,000.00			
	<b>Total .....</b>				<b>19,832,700.00</b>
19,780,700.00	Notes Outstanding .....				<b>5,107,000.00</b>
10,107,000.00					
	<b>Total (See Table 5) .....</b>				<b>\$249,572,800.00</b>
\$248,384,400.00	Equipment Trust Obligations (See Table 6) .....				<b>15,146,000.00</b>
16,380,000.00					
	<b>Total .....</b>				<b>264,718,800.00</b>
<b>WORKING LIABILITIES:</b>					
\$455,000.00	Loans and Bills Payable .....	\$455,000.00			
817,608.07	Traffic and Car Service Balances due to other Companies .....	1,071,555.36			
5,984,377.17	Audited Vouchers, Accounts and Wages Unpaid .....	6,945,724.58			
344,295.59	Miscellaneous Accounts Payable .....	270,825.39			
2,880,202.44	Matured Interest, Dividends and Rents Unpaid, including amounts due July 1 .....	2,933,534.68			
3,400.00	Matured Mortgage, Bonded and Secured Debt Unpaid, not presented for Redemption ..	38,673.80			
1,635,256.55	Other Working Liabilities .....	1,949,702.92			
	<b>Total .....</b>				<b>13,665,016.73</b>
<b>ACCRUED LIABILITIES NOT DUE:</b>					
\$1,697,303.31	Unmatured Interest and Rents Payable .....	\$1,571,827.65			
953,013.02	Taxes .....	982,398.61			
	<b>Total .....</b>				<b>2,554,226.26</b>
<b>DEFERRED CREDIT ITEMS:</b>					
\$1,983,983.09	Operating Reserves .....	\$1,286,086.33			
1,987,903.27	Other Deferred Credit Items .....	1,886,103.62			
	<b>Total .....</b>				<b>3,172,189.95</b>
<b>APPROPRIATED SURPLUS:</b>					
\$1,500,000.00	Reserve for Dividends No. 24, 2½ Per Cent., and No. 26, 2½ Per Cent. on Preferred	\$1,500,000.00			
361,500.54	Stock, payable October, 1912 and 1913, respectively .....	410,161.02			
915,941.37	Additions to Property since June 30, 1907, through Income .....	989,354.41			
	Insurance Reserve Fund .....				
	<b>Total .....</b>				<b>2,899,515.43</b>
2,777,441.91					
13,756,936.13	<b>PROFIT AND LOSS .....</b>				<b>17,374,558.20</b>
	<b>GRAND TOTAL .....</b>				<b>\$484,384,306.57</b>
\$480,041,120.55					

Outstanding Securities on Leasehold Estates and the contra asset in Property Investment, heretofore shown, are eliminated from this Balance Sheet. See explanation Page 24 and Table 7.

TABLE 3.

## PROFIT AND LOSS FOR YEAR ENDED JUNE 30, 1913.

Balance at Credit of this Account June 30, 1912 .....	\$13,756,936.13
Add:	
Credit Balance of Income for the Year .....	4,029,964.69
	\$17,786,900.82
Deduct:	
Discount on Securities charged off during the year .....	\$98,332.96
Value of Property Abandoned .....	58,711.25
Damages to Property occasioned by explosion of dynamite at Jellico, Tenn., September, 1906 ..	86,437.76
Advances to Delta Southern Railway written down .....	153,072.27
Net Miscellaneous Debits .....	15,788.38
	412,342.62
Credit Balance June 30, 1913 .....	\$17,374,558.20

TABLE 16.

## TRAFFIC STATISTICS FOR YEARS ENDED JUNE 30, 1913, AND 1912.

	1913.	1912.	Per Cent. of Increase or Decrease.
Average Miles of Road Operated .....	7,035.61	7,088.03	Dec. .74
<b>PASSENGER TRAFFIC:</b>			
Number of Passengers Carried .....	19,032,397	18,119,253	Inc. 5.04
Number of Passengers Carried One Mile .....	844,801,198	786,621,787	Inc. 7.40
Average Distance Hauled per Passenger .....	44.39	43.41	Inc. 2.26
Total Revenue from Passengers .....	\$18,220,489.43	\$16,939,811.36	Inc. 7.56
Average Receipts per Passenger per Mile .....	2.157	2.153	Inc. .19
Total Passenger-Train Revenue .....	\$21,938,211.23	\$20,567,269.66	Inc. 6.67
Passenger-Train Revenue per Mile of Road .....	\$ 3,118.17	\$ 2,901.69	Inc. 7.46
Passenger-Train Revenue per Train Mile .....	\$ 1.19335	\$ 1.15510	Inc. 3.31
Average Number of Passengers in Each Train .....	45.95	44.18	Inc. 4.01
*Average Number of Passengers in Each Car .....	13.18	12.98	Inc. 1.54
<b>FREIGHT TRAFFIC:</b>			
Revenue Freight:			
Number of Tons Carried .....	29,449,589	27,214,751	Inc. 8.21
Number of Tons Carried One Mile .....	4,577,486,801	4,206,785,057	Inc. 8.81

	1913.	1912.	Per Cent. of Increase or Decrease.
Average Distance Hauled per Ton .....	155.43	154.58	Inc. .55
Total Freight-Train Revenue .....	\$44,943,747.82	\$41,508,300.38	Inc. 8.28
Average Receipts per Ton per Mile .....	0.982	0.987	Dec. .51
Freight-Train Revenue per Mile of Road .....	\$ 6,388.04	\$ 5,856.11	Inc. 9.08
Freight-Train Revenue per Train Mile .....	\$ 2,548.11	\$ 2,467.16	Inc. 3.28
Average Number of Tons of Freight in Each Train .....	259.52	250.04	Inc. 3.79
Average Number of Tons of Freight in Each Loaded Car ..	14.86	14.53	Inc. 2.27
<b>All Freight (Including Company's Material Hauled Free):</b>			
Number of Tons Carried .....	35,311,676	32,373,584	Inc. 9.08
Number of Tons Carried One Mile .....	5,658,038,364	5,202,609,293	Inc. 8.75
Number of Tons Carried One Mile per Mile of Road .....	804,200	733,999	Inc. 9.57
Average Number of Tons of Freight in Each Train .....	320.79	309.23	Inc. 3.74
Average Number of Tons of Freight in Each Loaded Car ..	18.36	17.97	Inc. 2.17
<b>REVENUES AND OPERATING EXPENSES:</b>			
Passenger and Freight-Train Revenue .....	\$66,881,959.05	\$62,075,570.04	Inc. 7.74
Passenger and Freight-Train Revenue per Mile of Road .....	\$ 9,506.21	\$ 8,757.80	Inc. 8.55
†Operating Revenues .....	\$68,529,490.20	\$63,590,328.90	Inc. 7.77
Operating Revenues per Mile of Road .....	\$ 9,740.38	\$ 8,971.51	Inc. 8.57
Operating Revenues per Revenue Train Mile .....	\$ 1.95390	\$ 1.88928	Inc. 3.42
†Operating Expenses (Taxes Excluded) .....	\$48,273,923.55	\$43,696,236.39	Inc. 10.48
Operating Expenses per Mile of Road .....	\$ 6,861.37	\$ 6,164.79	Inc. 11.30
Operating Expenses per Revenue Train Mile .....	\$ 1.37638	\$ 1.29822	Inc. 6.02
†Net Operating Revenue .....	\$20,255,566.65	\$19,894,092.51	Inc. 1.82
Net Operating Revenue per Mile of Road .....	\$ 2,879.01	\$ 2,806.72	Inc. 2.58
Net Operating Revenue per Revenue Train Mile .....	\$ 0.57752	\$ 0.59106	Dec. 2.29

\*Includes Sleeping, Parlor and Observation Cars.

†Excludes Auxiliary Operations.

## THE CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY COMPANY.—THIRTY-THIRD ANNUAL REPORT.

FISCAL YEAR ENDED JUNE 30, 1913.

## To the Stockholders:

The Board of Directors herewith submit their report of the operations and affairs of the Rock Island Lines for the fiscal year ended June 30, 1913. The results of the operations for the year were as follows:

Total operating revenue (increase \$6,652,081.74, or 10.3 per cent.)	\$71,364,935.06
Operating expenses (increase \$5,744,608.13 or 12.3 per cent.)	52,504,102.14
Net operating revenue (increase \$907,473.61, or 5.1 per cent.)	\$18,860,832.92
Taxes (increase \$153,122.50, or 5.5 per cent.)	2,946,437.54
Operating income	\$15,914,395.38
Miscellaneous income	1,029,794.99
Total income	\$16,944,190.37
Interest and rentals	12,885,835.53

Balance of income, after providing for all charges, being 5.4 per cent. on capital stock (\$75,000,000.00)	\$4,058,354.84
Dividends paid (5 per cent. on capital stock)	3,743,525.00
Balance surplus for the year	\$314,829.84
For comparative income account in detail, see table on page 13.	

## CAPITAL STOCK.

No change occurred in the capital stock outstanding during the year, it remaining the same as at the close of the previous fiscal year.

## FUNDED DEBT.

The funded debt, not including equipment notes, compared with the previous fiscal year, shows a net increase of \$3,480,000.00, while the net increase in equipment notes was \$3,146,000.00, resulting in a total net increase in the funded debt of \$6,626,000.00.

For an analysis of the above, reference is made to pages 19 and 20.

## ROAD AND EQUIPMENT.

Your Company increased its property investment during the year, \$9,537,861.86, which represents expenditures for additions and betterments, as well as the acquisition of additional equipment, including equipment purchased under car trust agreements.

Complete details are exhibited on pages 17 and 18.

## NEW LINES ACQUIRED.

During the past year your Company acquired all the outstanding stock of the Rock Island, Stuttgart and Southern Railway Company, extending from Mesa, Arkansas, to Stuttgart, Arkansas, approximately twenty-two miles, through a well populated and prosperous agricultural community, rice being the principal commodity produced. The cost of this new line, together with additional terminal property acquired since its purchase, was \$168,737.42. The property is as yet separately operated; therefore none of its mileage, revenues, expenses or statistics are included in this report.

## NEW EQUIPMENT.

All the undelivered equipment to which attention was directed in the previous report, was received and placed in service during the present fiscal year.

During the current fiscal year, your Company placed orders for 87 locomotives, 30 of which are of the Pacific type, 25 of the Mikado type, 2 of the Mountain type and 30 for use in switching service. Orders were also placed for 72 steel passenger train cars (4 of which are to be Express Horse Cars), 2,050 freight train cars and 2 wrecking cranes.

Of the above equipment, 30 locomotives and 2 passenger train cars have been delivered; the balance are to be delivered during the ensuing fiscal year.

Of the 1,106 cars in passenger service on June 30th, 1913, 276 or 25 per cent. were of solid steel construction. Of the total passenger train cars, exclusive of Pullman equipment, run in through main line trains, 51 per cent. were of solid steel construction, and of the total mileage made by passenger train cars, exclusive of Pullman equipment, during the year covered by this report 40 per cent. was made by cars of solid steel construction.

The detail of the changes during the year appear on pages 39, 41 and 42.

## CONSTRUCTION OF NEW LINES.

That portion of the St. Paul and Kansas City Short Line Railroad between Carlisle, Iowa, and Allerton, Iowa, referred to in the two preceding reports as being under construction, was opened for local service July 2, 1913. Through passenger and freight train service was inaugurated September 14, 1913.

This line connects with that of your Company at Allerton, Iowa, for Kansas City, Missouri, and points south and southwest, and at Manly, Iowa, for the so-called Twin Cities of Minnesota and the Northwest. The intermediate connections with your Company at Des Moines, Iowa, and Iowa Falls, Iowa, afford an excellent outlet for traffic to and from East and West, as well as the advantage of interchanging traffic with several other trunk line systems at the above points.

Construction of the Malvern and Camden Railway (referred to in last year's report), extending from Malvern, Arkansas, to Camden, Arkansas, has been completed since the close of the fiscal year under review and it was opened for operation on October 1, 1913.

## GENERAL.

The records maintained by the industrial department, show that there were located along the lines of your Company, during the fiscal year just ended, one hundred and forty-four new industries at an estimated cost for construction of over four million dollars. It is estimated that the operation of these industries will yield employment to over twenty-five hundred men and result in an annual movement of more than eighteen thousand carloads of revenue freight. Such industries will also produce a heavy volume of less than carload freight.

Industrial tracks were constructed to seventy-seven private industries and to six coal mines, necessitating the construction of eighty-three new tracks during the period for which this report is rendered. Additional track improvement was made in the way of re-arranging and extending tracks to fifteen industries. An expenditure of \$1,098,768.75 was made during the current fiscal year for the completion and erection of additional and improved terminal facilities.

In order that the Trinity and Brazos Valley Railway Company might

meet its payments for additions and betterments, equipment and operating deficit during the current fiscal year, your Company advanced one-half of the necessary funds, aggregating \$469,918.80.

During the year under review the Arkansas and Memphis Railway Bridge and Terminal Company was incorporated for the purpose of building a double track steel bridge across the Mississippi River at Memphis, Tennessee. Construction is now under way and this bridge when completed will be equally owned by The Chicago, Rock Island and Pacific Railway Company, St. Louis, Iron Mountain and Southern Railway and St. Louis Southwestern Railway Company, and when it is in operation the transfer charges of this Company at that point will be very materially reduced.

At the close of the year your Company was carrying on its pension rolls 155 superannuated employees and the expenses of the Pension Department during the year under review were \$54,762.24.

By order of the Board of Directors,

H. U. MUDGE,  
President.

October 6, 1913.

## INCOME ACCOUNT.

YEAR ENDED JUNE 30, 1913, COMPARED WITH PREVIOUS YEAR.

	1912-13.	1911-12.	Amount.	Per Cent.
Average mileage operated	8,048.07	8,035.84	12.23	.15
Revenue from transportation:				
Freight	\$46,428,045.31	\$41,156,834.72	\$5,271,210.59	12.81
Passenger	19,777,430.86	18,609,408.36	1,168,022.50	6.28
Mail	1,611,311.99	1,602,209.29	9,102.70	.57
Express	2,055,123.03	2,014,386.03	40,737.00	2.02
Miscellaneous	981,093.46	873,417.38	107,676.08	12.33
Total transportation revenue	\$70,853,004.65	\$64,256,255.78	\$6,596,748.87	10.27
Revenue from operations other than transportation:	511,930.41	456,597.54	55,332.87	12.12
Total operating revenue	\$71,364,935.06	\$64,712,853.32	\$6,652,081.74	10.28
Operating expenses:				
Maintenance of way and structures	\$9,885,323.86	\$8,493,345.86	\$1,391,978.00	16.39
Maintenance of equipment	10,072,854.15	8,302,466.70	1,770,387.45	21.32
Traffic expenses	1,999,138.20	1,981,398.97	17,739.23	.90
Transportation expenses	28,772,587.34	26,210,502.08	2,562,085.26	9.78
General expenses	1,774,198.59	1,771,780.40	2,418.19	.14
Total operating expenses	\$52,504,102.14	\$46,759,494.01	\$5,744,608.13	12.29
Net operating revenue	\$18,860,832.92	\$17,953,359.31	\$907,473.61	5.05
Taxes	2,946,437.54	2,793,315.04	153,122.50	5.48
Operating income	\$15,914,395.38	\$15,160,044.27	\$754,351.11	4.98
Outside operations (debit balance)	\$191,577.32	\$196,976.63	\$5,399.31	2.74
Hire of equipment (debit balance)	867,856.82	990,827.67	122,970.85	12.41
Other income	2,089,229.13	1,915,048.94	174,180.19	9.10
Total	\$1,029,794.99	\$727,244.64	\$302,550.35	41.60
Total income	\$16,944,190.37	\$15,887,288.91	\$1,056,901.46	6.65
Interest	\$11,066,032.36	\$10,492,134.63	\$573,897.73	5.47
Rentals	1,819,803.17	1,544,758.36	275,044.81	17.81
Total charges	\$12,885,835.53	\$12,036,892.99	\$848,942.54	7.05
Balance of income (available for dividends)	\$4,058,354.84	\$3,850,395.92	\$207,958.92	5.40
Dividends	3,743,525.00	3,743,760.00	*235.00	*.01
Balance surplus (carried to credit of profit and loss)	\$314,829.84	\$106,635.92	\$208,193.92	195.24

\*Decrease.

## DIVIDEND DECLARED DURING YEAR ENDED JUNE 30, 1913.

Dividend No. 129, 1¼ per cent. paid September 30, 1912	\$935,881.25
Dividend No. 130, 1¼ per cent. paid December 31, 1912	935,881.25
Dividend No. 131, 1¼ per cent. paid March 31, 1913	935,881.25
Dividend No. 132, 1¼ per cent. paid June 30, 1913	935,881.25
Total, 5 per cent.	\$3,743,525.00

## PROFIT AND LOSS.

Credit balance, June 30, 1912	\$14,598,083.97
Surplus for year ended June 30, 1913	\$314,829.84
Sundry adjustments not affecting current year's income, etc.	121,869.92
	\$436,699.76
Less:	
Loss on securities and land sold	\$847,652.02
Miscellaneous adjustments, etc.	62,235.43
	\$909,887.45
Depreciation on:	
Tracks removed	\$30,976.72
Structures sold, removed or destroyed	11,447.14
Equipment sold, dismantled or destroyed	477,621.29
	520,045.15
	1,429,932.60
	993,232.84
Credit balance, June 30, 1913	\$13,604,851.13

CONDENSED GENERAL BALANCE SHEET.  
JUNE 30, 1913, AND COMPARISON WITH PREVIOUS YEAR.

ASSETS.	1913.	1912.	INCREASE DECREASE.	LIABILITIES.	1913.	1912.	INCREASE DECREASE.
<b>Property Investment:</b>				<b>Stock:</b>			
<i>Road and Equipment:</i>				Capital stock.....	\$75,000,000.00	\$75,000,000.00	.....
Investment to June 30, 1907 .....	\$255,585,343.24	\$255,585,343.24	.....	Mortgage, bonded and secured debt:			
Investment since June 30, 1907 .....	41,148,338.63	31,610,476.77	\$9,537,861.86	Funded debt .....	257,815,600.00	251,189,600.00	\$6,626,000.00
Reserved for accrued depreciation—credit .....	755,302.30	609,043.31	—\$146,258.99	Total capital liabilities.....	\$332,815,600.00	\$326,189,600.00	\$6,626,000.00
Total road and equipment .....	\$295,978,379.57	\$286,586,776.70	\$9,391,602.87	<b>Working liabilities:</b>			
<b>Securities:</b>				Traffic and car-service balances due to other companies .....	\$1,249,335.10	\$917,345.51	\$331,989.59
Securities of proprietary affiliated and controlled companies—pledged .....	604,321.24	180,233.16	424,088.08	Audited vouchers and wages unpaid .....	6,667,154.31	3,703,690.95	2,963,463.36
Securities issued or assumed—pledged .....	340,000.00	.....	340,000.00	Miscellaneous accounts payable .....	231,343.50	292,048.29	—60,704.79
Securities of proprietary, affiliated and controlled companies—unpledged .....	6,348,208.52	7,044,138.42	—\$695,929.90	Matured interest, dividends and rents unpaid.....	2,254,945.25	2,235,041.25	19,904.00
<b>Other investments:</b>				Matured mortgage, bonded and secured debt unpaid .....	23,000.00	23,000.00	.....
Advances to proprietary, affiliated and controlled companies for construction, equipment and betterments .....	10,606,449.33	8,873,117.75	1,733,331.58	Working advances due to other companies.....	241,052.32	190,620.30	50,432.02
Miscellaneous investments .....	2,418,868.70	2,471,175.52	—52,306.82	Other working liabilities..	1,092,808.88	1,002,748.53	90,060.35
Total property investment.....	\$316,296,227.36	\$305,155,441.55	\$11,140,785.81	Total working liabilities .....	\$11,759,639.36	\$8,364,494.83	\$3,395,144.53
<b>Working assets:</b>				<b>Accrued liabilities not due:</b>			
Cash .....	\$5,120,466.84	\$15,073,939.94	—\$9,953,473.10	Unmatured interest, dividends and rents payable .....	\$2,410,289.92	\$2,425,223.42	—\$14,933.50
Securities issued or assumed—held in treasury .....	5,033,458.23	557,458.23	4,476,000.00	Taxes accrued .....	1,313,030.07	1,317,869.45	—4,839.38
Marketable securities.....	15,472,007.18	15,946,140.08	—474,132.90	Total accrued liabilities not due .....	\$3,723,319.99	\$3,743,092.87	—\$19,772.88
Loans and bills receivable .....	202,512.48	484,567.43	—282,054.95	<b>Deferred credit items:</b>			
Traffic and car-service balances due from other companies .....	943,713.90	652,253.82	291,460.08	Operating reserves .....	\$1,569,169.38	\$1,007,518.39	\$561,650.99
Net balance due from agents and conductors .....	1,085,143.39	1,058,584.79	26,558.60	Other deferred credit items .....	1,197,964.63	942,215.92	255,748.71
Miscellaneous accounts receivable .....	3,591,475.79	3,284,397.25	307,078.54	Total deferred credit items .....	\$2,767,134.01	\$1,949,734.31	\$817,399.70
Materials and supplies.....	7,067,641.97	5,934,979.99	1,132,661.98	Grand total liabilities.....	\$351,065,693.36	\$340,246,922.01	\$10,818,771.35
Other working assets.....	2,545,423.99	1,845,871.15	699,552.84	<b>Appropriated Surplus:</b>			
Total working assets .....	\$41,061,843.77	\$44,838,192.68	—\$3,776,348.91	Additions to property since June 30, 1907, through income .....	64,367.76	64,367.76	.....
<b>Accrued income not due:</b>				<b>Profit and loss:</b>			
Unmatured interest, dividends and rents receivable .....	\$913,464.34	\$656,656.94	\$256,807.40	Balance .....	13,604,851.13	14,598,083.97	—\$993,232.84
<b>Deferred debit items:</b>				Grand total.....	\$364,734,912.25	\$354,909,373.74	\$9,825,538.51
Advances .....	\$4,030,914.93	\$2,799,127.71	\$1,231,787.22				
Rents and insurance paid in advance .....	27,986.91	33,772.60	—\$5,785.69				
Special deposits .....	104,874.73	227,610.98	—122,736.25				
Other deferred debit items .....	2,299,600.21	1,198,571.28	1,101,028.93				
Total deferred debit items .....	\$6,463,376.78	\$4,259,082.57	\$2,204,294.21				
Grand total.....	\$364,734,912.25	\$354,909,373.74	\$9,825,538.51				

NOTE—In stating the assets and liabilities of the companies forming the Rock Island Lines, the holdings of The Chicago, Rock Island and Pacific Railway Company in the bonds and capital stock of the auxiliary lines, together with loans between the various companies, have been eliminated

from the liabilities and a like reduction made in the assets pertaining thereto; the figures shown, therefore, represent the book value of the assets and the liabilities without duplication.

<b>ROAD AND EQUIPMENT—INVESTMENT SINCE JUNE 30, 1907.</b>			
CHANGES DURING YEAR ENDED JUNE 30, 1913.			
Balance, June 30, 1912, as per balance sheet, page 14.....	\$31,610,476.77		
CHANGES DURING THE YEAR:			
<b>Additions:</b>			
Additions and betterments, current year (not including equipment), see page 18.....	\$3,143,778.53		
<b>Expenditures for additional and improved equipment:</b>			
Purchase of 175 ballast cars.....	\$190,743.40		
Purchase of 10 automatic air dump cars .....	23,824.40		
Converting dining cars 1646 and 1647 into parlor cars .....	4,477.43		
Converting mail cars 1535 and 1544 into air-brake instruction cars .....	1,034.59		
Converting 5 flat cars into bank levelers .....	1,686.30		
New appliances for existing equipment, required by federal and state laws .....	82,685.39		
Miscellaneous and inspection charges in connection with purchase of business steel car No. 1911....	425.00		
Other new appliances for existing equipment .....	27,807.69	332,684.20	
Total additions and betterments, as per page 18 .....	\$3,476,462.73		

Disbursements for construction of Malvern and Camden Railway (property of Rock Island, Arkansas and Louisiana Railroad Company) .....	898,597.94		
Purchase of equipment to take the place of that destroyed which, under mortgages and equipment trust agreements, must be replaced.....	473,520.60		
Bankers Trust Company of New York, equipment purchase under indenture of July 1, 1912 .....	5,419,941.51		
Additions and betterments on leased lines.....	2,902.45		
Net amount of miscellaneous adjustments covering equipment purchased under car trust agreements, prior to the current fiscal year..	16,240.01		
	\$10,287,665.24		

**Deductions:**

Value of equipment destroyed, dismantled or sold during the past fiscal year (exclusive of equipment which, under mortgages or equipment trust agreements, must be replaced). Such value, less salvage, was charged to operating expenses and profit and loss.....	\$632,481.49		
Reduction in book value, from par to actual cost, of The Chicago, Rock Island and Gulf Railway Company's first mortgage Amarillo Division bonds, such reduction being charged to profit and loss.....	117,321.89	749,803.38	

Net increase .....	9,537,861.86		
Balance, June 30, 1913, as per balance sheet, page 14..	\$41,148,338.63		

## EXPENDITURES FOR ADDITIONS AND BETTERMENTS.

YEAR ENDED JUNE 30, 1913.

Right of way and station grounds.....	\$ 111,354.22	
Real estate .....	21,238.26	
Widening cuts and fills.....	144,437.58	
Protection of banks .....	25,336.93	
Grade revisions and changes of line.....	8,128.69	
Bridges, trestles and culverts.....	253,676.26	
Increased weight of rail.....	114,896.34	
Improved frogs and switches.....	9,235.28	
Track fastenings and other material.....	214,906.05	
Ballast .....	590,068.11	
Sidings and spur tracks .....	168,146.51	
Terminal yards .....	71,902.70	
Fencing right of way.....	16,089.92	
Improvement of over and under grade crossings	4,230.85	
Track elevation, elimination of grade crossings,		
etc. ....	318,995.11	
Interlocking apparatus .....	18,057.13	
Block and other signal apparatus.....	44,806.32	
Telegraph and telephone lines.....	7,938.95	
Station buildings and fixtures.....	360,803.93	
Shops, engine houses and turn tables.....	110,296.80	
Shop machinery and tools.....	22,994.00	
Water and fuel stations.....	88,547.57	
Grain elevators and storage warehouses.....	371,079.85	
Dock and wharf property.....	103.00	
Electric light and power plants.....	183.02	
Electric power transmission .....	3,181.58	
Snow and sand fences and snow sheds.....	6,093.56	
Miscellaneous structures .....	6,498.04	
Interest and commissions .....	28,125.00	\$3,143,778.53

## \*Equipment:

Steam locomotives .....	\$ 26,946.54	
Passenger train cars .....	20,312.09	
Freight train cars .....	67,109.94	
Work equipment .....	218,315.63	332,684.20

Total additions and betterments..... \$3,476,462.73

The above amount was expended by the following companies:

The Chicago, Rock Island & Pacific Railway		
Company .....	\$3,392,397.27	
The Chicago, Rock Island and Gulf Railway		
Company .....	47,459.53	
Rock Island, Arkansas and Louisiana Rail-		
road Company .....	36,605.93	\$3,476,462.73

Expenditures for additions and betterments were also made by the following subsidiary companies:

Rock Island Improvement Company.....	\$ 56,038.67	
Keokuk and Des Moines Railway Company		
(leased line) .....	2,902.45	58,941.12

Total expenditures by all companies during the year.. \$3,535,403.85

\*Also described on page 17.

Figures in *italics* denote credits.

## MAINTENANCE OF WAY AND STRUCTURES—REMARKS.

YEAR ENDED JUNE 30, 1913.

## COMPARATIVE STATEMENTS OF RAIL AND BALLAST IN MAIN AND BRANCH LINES OWNED OR LEASED AS OF JUNE 30, 1912 AND 1913.

	RAIL	TOTAL MILES OWNED OR LEASED	WEIGHT PER YARD AND MILES OF EACH WEIGHT.								52 and under
			100	85-90	80	Re-rolled 80	70	65-6-7-8	60	56-8	
MAIN LINES											
1913	First track .....	*4,418.65	161.73	†1,250.02	1,801.73	284.53	36.37	575.87	308.40	.....	.....
	Second track .....	267.28	51.24	142.63	72.76	.....	.65	.....	.....	.....	.....
	Third track .....	8.01	.....	.....	1.40	.....	6.61	.....	.....	.....	.....
	Total .....	4,693.94	212.97	1,392.65	1,875.89	284.53	43.63	575.87	308.40	.....	.....
	Per cent. of main lines.....	.....	4.54	29.67	39.96	6.06	.93	12.27	6.57	.....	.....
1912	First track .....	*4,418.71	70.98	1,229.86	1,886.98	246.63	36.37	607.76	340.13	.....	.....
	Second track .....	267.34	36.43	148.94	78.04	.....	3.93	.....	.....	.....	.....
	Third track .....	8.01	.....	.....	1.31	.....	6.70	.....	.....	.....	.....
	Total .....	4,694.06	107.41	1,378.80	1,966.33	246.63	47.00	607.76	340.13	.....	.....
	Per cent. of main lines.....	.....	2.29	29.37	41.89	5.25	1.00	12.95	7.25	.....	.....
BRANCH LINES											
1913	First track .....	3,002.43	.....	†32.44	269.00	51.43	329.84	304.97	1,182.40	575.73	256.62
	Second track .....	14.90	.....	5.02	1.83	.....	.16	.....	7.89	.....	.....
	Total .....	3,017.33	.....	37.46	270.83	51.43	330.00	304.97	1,190.29	575.73	256.62
	Per cent. of branch lines.....	.....	.....	1.24	8.98	1.70	10.94	10.11	39.45	19.08	8.50
1912	First track .....	3,002.54	.....	24.74	268.27	37.65	338.91	304.84	1,184.75	580.42	262.96
	Second track .....	14.90	.....	5.02	1.83	.....	.16	.....	7.89	.....	.....
	Total .....	3,017.44	.....	29.76	270.10	37.65	339.07	304.84	1,192.64	580.42	262.96
	Per cent. of branch lines.....	.....	.....	.99	8.95	1.25	11.24	10.10	39.52	19.24	8.71
1913	Total track .....	7,711.27	212.97	1,430.11	2,146.72	335.96	373.63	880.84	1,498.69	575.73	256.62
	Per cent. of total track.....	.....	2.76	18.55	27.83	4.36	4.85	11.42	19.43	7.47	3.33
1912	Total track .....	7,711.50	107.41	1,408.56	2,236.43	284.28	386.07	912.60	1,532.77	580.42	262.96
	Per cent. of total track.....	.....	1.39	18.27	29.00	3.69	5.00	11.83	19.88	7.53	3.41

	BALLAST	TOTAL MILES OWNED OR LEASED	KIND OF BALLAST AND MILES OF EACH KIND					SAND OR DIRT
			Rock	Burned Clay	Gravel	Cinder	Total	
MAIN LINES								
1913	First track .....	*4,418.65	1,406.87	587.62	1,534.52	315.48	3,844.49	574.16
	Second track .....	267.28	22.14	.....	218.88	23.26	264.28	3.00
	Third track .....	8.01	.25	.....	.39	7.37	8.01	.....
	Total .....	4,693.94	1,429.26	587.62	1,753.79	346.11	4,116.78	577.16
	Per cent. of main lines.....	.....	30.45	12.52	37.36	7.37	87.70	12.30
1912	First track .....	*4,418.71	1,371.45	565.37	1,435.33	318.04	3,690.19	728.52
	Second track .....	267.34	17.26	.....	219.28	27.80	264.34	3.00
	Third track .....	8.01	.....	.....	.39	7.62	8.01	.....
	Total .....	4,694.06	1,388.71	565.37	1,655.00	353.46	3,962.54	731.52
	Per cent. of main lines.....	.....	29.58	12.05	35.26	7.53	84.42	15.58
BRANCH LINES								
1913	First track .....	3,002.43	117.75	35.16	659.61	265.76	1,078.28	1,924.15
	Second track .....	14.90	.....	.....	.50	14.40	14.90	.....
	Total .....	3,017.33	117.75	35.16	660.11	280.16	1,093.18	1,924.15
	Per cent. of branch lines.....	.....	3.90	1.17	21.88	9.28	36.23	63.77
1912	First track .....	3,002.54	115.00	35.16	656.46	266.04	1,072.66	1,929.88
	Second track .....	14.90	.....	.....	.50	14.40	14.90	.....
	Total .....	3,017.44	115.00	35.16	656.96	280.44	1,087.56	1,929.88
	Per cent. of branch lines.....	.....	3.81	1.17	21.77	9.29	36.04	63.96
1913	Total track .....	7,711.27	1,547.01	622.78	2,413.90	626.27	5,209.96	2,501.31
	Per cent. of total track.....	.....	20.06	8.08	31.30	8.12	67.56	32.44
1912	Total track .....	7,711.50	1,503.71	600.53	2,311.96	633.90	5,050.10	2,661.40
	Per cent. of total track.....	.....	19.50	7.78	29.98	8.22	65.48	34.52

\*See statement on next page, showing the miles which are classified as "Main lines."

†Includes 24.53 miles of main line and 7.70 miles of branch line of 90 pound rail.

### MAINTENANCE OF WAY AND STRUCTURES—REMARKS, YEAR ENDED JUNE 30, 1913.

The following is a comparative statement of miles of the first track main lines (as distinguished from branch lines) owned or leased, not including trackage rights, which are used in the rail and ballast tables on preceding page:

	JUNE 30	
	1913	1912
Chicago, Ill., to Colorado Springs, Colo.....	1,063.03	1,063.09
Davenport, Ia., to Dallas, Tex. (via Kansas City).....	833.61	833.61
Herington, Kan., to Santa Rosa, N. M.....	526.92	526.92
Burlington, Ia., to Minneapolis, Minn.....	307.58	307.58
Altamont, Mo., to North Topeka, Kan. (via St. Joseph).....	137.91	137.91
McFarland, Kan., to Belleville, Kan.....	103.19	103.19
Memphis, Tenn., to Tucumcari, N. M.....	869.87	869.87
Biddle, Ark., to Eunice, La.....	292.64	292.64
St. Louis, Mo., to Kansas City, Mo.....	283.90	283.90
	4,418.65	4,418.71

Improvements to roadway have been made as follows:

Ties were renewed to the extent of 2,507,784, or an average of 328 per mile of first, second and third main track owned and leased; of these ties, 2,027,917 were treated with creosote.

Track miles of new ballast.....	159.86 miles
Track miles rebalasted.....	143.55 miles
Miles of roadbed widened to standard width.....	188.01 miles
Road miles of new right of way fence built.....	77.34 miles
Linear feet, transversely to track, of concrete arch culverts built.....	2,952 feet
Linear feet, transversely to track, of iron pipe culverts built.....	2,997 feet
Linear feet, transversely to track, of vitrified pipe culverts built.....	257 feet
Linear feet of timber bridges or trestles replaced with steel, concrete or masonry bridges.....	1,095 feet
Linear feet of bridges and trestles filled.....	5,155 feet
Linear feet of iron or steel bridges replaced with heavier structures.....	1,728 feet
Linear feet of new pile trestles built.....	534 feet
Linear feet of new steel bridges built.....	74 feet

The following table shows the aggregate length and nature of bridges at June 30, 1913, compared with previous year:

BRIDGES	KIND OF BRIDGE AND LENGTH (IN FEET) OF EACH KIND					
	TOTAL (FEET)	Steel and iron	Combination (wood and masonry)	Wooden	Trestles	
Main track, June 30, 1913.....	502,680	150,883	891	900	2,199	347,807
Per cent. of total length.....		30.01	.18	.18	.44	69.19
Main track, June 30, 1912.....	506,048	151,123	891	912	2,282	350,840
Per cent. of total length.....		29.86	.18	.18	.45	69.33

The average expense of maintenance of way and structures per mile of first, second and third main track owned and leased during the past fiscal year was \$1,229.04 as against \$1,072.10 last year.

The average expense of maintenance of way and structures per mile of first main track owned and leased for the fiscal year ended June 30, 1913, was \$1,277.48, compared with \$1,114.40 for the previous year.

All the rail relaid during the year has replaced lighter weight, and a corresponding increase in metal has been made in appliances.

### FREIGHT TRAFFIC STATISTICS.

YEAR ENDED JUNE 30, 1913, COMPARED WITH PREVIOUS YEAR.

	1912-13	1911-12	INCREASE OR DECREASE
Revenue per ton mile.....	\$ .0089	\$ .0089	
Revenue per ton.....	\$ 2.200	\$ 2.170	\$ .030
Revenue per train mile.....	\$ 2.651	\$ 2.486	\$ .165
Revenue per car mile (excludes caboose car miles).....	\$ .1024	\$ .0969	\$ .0055
Revenue per mile of road.....	\$5,768.84	\$5,121.66	\$647.18
Number of tons per train mile—revenue freight.....	297.17	277.81	19.36
Number of tons per train mile—company freight.....	59.29	51.97	7.32
Number of tons per train mile—all freight.....	356.46	329.78	26.68
Number of tons per loaded car mile—revenue freight.....	15.79	15.11	.68
Number of tons per loaded car mile—company freight.....	3.15	2.83	.32
Number of tons per loaded car mile—all freight.....	18.94	17.94	1.00
Number of tons per loaded and empty car mile—revenue freight.....	11.47	10.83	.64
Number of tons per loaded and empty car mile—company freight.....	2.29	2.03	.26
Number of tons per loaded and empty car mile—all freight.....	13.76	12.86	.90
Number of cars per train—loaded.....	18.82	18.36	.46
Number of cars per train—empty.....	7.07	7.25	—18
Number of cars per train—all.....	25.89	25.61	.28
Average haul per ton—revenue freight (in miles).....	246.61	242.46	4.15

Average haul per ton—company freight (in miles).....	155.65	135.64	20.01
Average haul per ton—all freight (in miles).....	224.76	215.69	9.07
Average ton miles of revenue freight per mile operated.....	646,611	572,340	74,271

### PASSENGER TRAFFIC AND PER MILE OF ROAD STATISTICS. YEAR ENDED JUNE 30, 1913, COMPARED WITH PREVIOUS YEAR.

	1912-13	1911-12	INCREASE OR DECREASE
PASSENGER TRAFFIC:			
Revenue per passenger mile.....	\$ .0201	\$ .0198	\$ .0003
Revenue per passenger.....	\$ 1.018	\$ .983	\$ .035
Revenue per train mile (excluding mail, express, etc.).....	\$ 1.013	\$ .975	\$ .038
Revenue per train mile (including mail, express, etc.).....	\$ 1.214	\$ 1.179	\$ .035
Revenue per car mile (cars carrying passengers).....	\$ .275	\$ .261	\$ .014
Revenue per mile of road (excluding mail, express, etc.).....	\$2,457.41	\$2,315.80	\$141.61
Revenue per mile of road (including mail, express, etc.).....	\$2,945.38	\$2,802.16	\$143.22
Number of passengers per train mile.....	50.38	49.21	1.17
Number of passengers per car mile (cars carrying passengers).....	13.70	13.16	.54
Average distance carried (in miles).....	50.67	49.63	1.04
Number of cars per train.....	5.24	5.28	—0.04
Average miles of revenue passengers per mile operated.....	122,228	116,900	5,328
PER MILE OF ROAD:			
Total operating revenue.....	\$8,867.33	\$8,053.03	\$814.30
Operating expenses.....	6,523.81	5,818.87	704.94
Net operating revenue.....	\$2,343.52	\$2,234.16	\$109.36
Taxes.....	366.10	347.61	18.49
Operating income.....	\$1,977.42	\$1,886.55	\$ 90.87
Outside operations (debit balance).....	23.80	24.51	.71
Hire of equipment (debit balance).....	107.83	123.30	15.47
Other income.....	259.59	238.32	21.27
Total income.....	\$2,105.38	\$1,977.06	\$128.32
Interest.....	\$1,374.99	\$1,305.67	\$ 69.32
Rentals.....	226.11	192.23	33.88
Total charges.....	\$1,601.10	\$1,497.90	\$103.20
Balance of income (available for dividends).....	\$ 504.28	\$ 479.16	\$ 25.12

### MILEAGE AND TRAFFIC STATISTICS.

YEAR ENDED JUNE 30, 1913, COMPARED WITH PREVIOUS YEAR.

	1912-13.	1911-12.	INCREASE—Per Number. Cent.
Average miles of road operated.....	8,048.07	8,035.84	12.23 .15
Miles of road operated June 30.....	8,048.14	8,041.66	6.48 .08
Freight train miles.....	16,761.671	15,827,359	934,312 5.90
Passenger train miles.....	18,775,070	18,360,282	414,788 2.26
Mixed train miles.....	749,876	728,074	21,802 2.99
Special train miles.....	35,654	28,188	7,466 26.49
Total revenue train miles.....	36,322,271	34,943,903	1,378,368 3.94
Non-revenue service train miles.....	1,198,768	764,911	433,857 56.72
Total train miles.....	37,521,039	35,708,814	1,812,225 5.08
Loaded freight car miles.....	329,524,850	304,348,818	25,176,032 8.27
Empty freight car miles (excludes caboose car miles).....	123,795,711	120,205,068	3,590,643 2.99
Total freight car miles (excludes caboose car miles).....	453,320,561	424,553,886	28,766,675 6.78
Caboose car miles.....	16,389,774	15,744,038	645,736 4.10
Grand total freight car miles.....	469,710,335	440,297,924	29,412,411 6.68
Passenger car miles (including baggage, mail and express).....	102,218,799	100,853,064	1,365,735 1.35
Passenger car miles (carrying passengers).....	71,803,749	71,363,809	439,940 .62
Number of tons moved—revenue freight.....	21,101,989	18,969,251	2,132,738 11.24
Number of tons moved—company freight.....	6,671,134	6,343,259	327,875 5.17
Number of tons moved—all freight.....	27,773,123	25,312,510	2,460,613 9.72
Number of tons moved one mile—revenue freight.....	5,203,973,087	4,599,242,133	604,730,954 13.15
Number of tons moved one mile—company freight.....	1,038,345,549	860,382,165	177,963,384 20.68
Number of tons moved one mile—all freight.....	6,242,318,636	5,459,624,298	782,694,338 14.34
Number of passengers carried.....	19,412,671	18,927,146	485,525 2.57
Number of passengers carried one mile.....	983,696,182	939,391,981	44,304,201 4.72

## THE MISSOURI PACIFIC RAILWAY COMPANY.

St. Louis, Mo., September 10th, 1913.

To the Stockholders of

THE MISSOURI PACIFIC RAILWAY COMPANY AND THE  
ST. LOUIS, IRON MOUNTAIN & SOUTHERN RAILWAY COMPANY:  
The Boards of Directors herewith submit their report of affairs for the  
fiscal year ended June 30, 1913.  
The summary of results from operation is as follows:

	1913.	1912.	Amount.	Per Cent.
Average mileage Operated	7,257.00	7,230.77	26.23	.36
<b>RAILWAY OPERATING INCOME:</b>				
<b>RAIL OPERATIONS—</b>				
<b>REVENUE:</b>				
Freight .....	\$45,748,269.39	\$39,514,355.87	\$6,233,913.52	15.78
Passenger .....	11,627,480.60	10,662,443.17	965,037.43	9.05
Passenger—Other .....	199,628.55	196,006.14	3,622.41	1.85
Mail .....	1,450,607.97	1,429,607.72	21,000.25	1.47
Express .....	1,711,305.35	1,374,454.41	336,850.94	24.51
Miscellaneous .....	934,168.02	891,224.79	42,943.23	4.82
Total Revenue from Transportation .....	\$61,671,459.88	\$54,068,092.10	\$7,603,367.78	14.06
Nontransportation Revenue .....	484,046.26	435,157.82	48,888.44	11.23
Total Operating Revenues .....	\$62,155,506.14	\$54,503,249.92	\$7,652,256.22	14.04
<b>RAIL OPERATIONS—</b>				
<b>EXPENSES:</b>				
Maintenance of Way and Structures .....	\$ 9,263,360.32	\$ 8,664,769.03	\$ 598,591.29	6.91
Maintenance of Equipment .....	9,860,187.54	8,321,786.50	1,538,401.04	18.49
Traffic Expenses .....	1,425,167.92	1,358,014.19	67,153.73	4.94
Transportation Expenses .....	22,528,447.44	21,268,313.87	1,260,133.57	5.92
General Expenses .....	1,621,833.83	1,667,708.42	—45,874.59	2.75
Total Operating Expenses .....	\$44,698,997.05	\$41,280,592.01	\$3,418,405.04	8.28
Net Revenues—Rail Operations .....	\$17,456,509.09	\$13,222,657.91	\$4,233,851.18	32.02
Net Deficit from Auxiliary Operations .....	93,004.62	120,852.76	—27,848.14	23.04
Net Railway Operating Revenue .....	\$17,363,504.47	\$13,101,805.15	\$4,261,699.32	32.53
<b>RAILWAY TAX ACCRUALS.</b>				
Railway Operating Income .....	\$15,049,155.74	\$10,883,786.75	\$4,165,368.99	38.27
<b>OTHER INCOME:</b>				
Rent .....	\$ 519,527.98	\$ 491,823.20	\$ 27,704.78	5.63
Dividends from Stock .....	78,751.50	315,466.00	—236,714.50	75.04
Interest .....	1,833,771.35	1,355,708.75	478,062.60	35.26
Miscellaneous Income .....	31,548.07	83,647.51	—52,099.44	62.28
Total Other Income .....	\$ 2,463,598.90	\$ 2,246,645.46	\$ 216,953.44	9.66
Gross Income .....	\$17,512,754.64	\$13,130,432.21	\$4,382,322.43	33.38
<b>DEDUCTIONS FROM GROSS INCOME:</b>				
Rent .....	\$ 998,580.08	\$ 882,749.53	\$ 115,830.55	13.12
Equipment Rents—Debit Balance .....	477,240.27	746,367.21	—269,126.94	36.06
Interest .....	14,408,124.59	13,436,313.58	971,811.01	7.23
Miscellaneous Deductions .....	66,075.82	44,093.38	21,982.44	49.85
Total Deductions .....	\$15,950,020.76	\$15,109,523.70	\$ 840,497.06	5.56
Net Income or Loss .....	\$ 1,562,733.88	Def. \$1,979,091.49	\$3,541,825.37	
Operating Revenue per mile of road .....	\$ 8,564.90	\$ 7,537.68	\$ 1,027.22	13.63
Operating Revenue per revenue train mile .....	2.23.867	2.07.466	.16.401	7.91
Operating Expense per mile of road .....	6,159.43	5,709.02	450.41	7.89
Operating Expense per revenue train mile .....	1.60.993	1.57.134	.03.859	2.46
Net Operating Revenue per mile of road .....	2,405.47	1,828.66	576.81	31.54
Net Operating Revenue per revenue train mile .....	.62.874	.50.332	.12.542	24.92
Ratio of Operating Expense to Operating Revenue .....	71.91%	75.74%	—3.83%	

For comparative purposes, the figures for the year ended June 30th, 1912, have been revised to compare with the present year, and to agree with the Classification of the Interstate Commerce Commission.

## CAPITAL STOCK.

There has been no change in the capital stock during the year.

## FUNDED DEBT.

The following changes were effected in the funded debt in hands of the public during the year:

THE MISSOURI PACIFIC RAILWAY COMPANY—  
Funded Debt decreased .....\$ 24,000.00  
Equipment Trust Obligations decreased..... 1,437,000.00

TOTAL DECREASE ..... \$1,461,000.00  
ST. LOUIS, IRON MOUNTAIN & SOUTHERN RAILWAY COMPANY—  
Funded Debt increased .....\$5,542,095.00  
Equipment Trust Obligations decreased..... 1,213,000.00

TOTAL INCREASE ..... \$4,329,095.00

Statements on pages 21 and 27 give in detail the changes in these obligations.

The St. Louis, Iron Mountain & Southern Railway Company has purchased and retired the remaining bonds outstanding in the hands of the public under its First Preferred Income Consolidated Mortgage, amounting to \$37,905.

The St. Louis, Iron Mountain & Southern Railway Company also retired, during the year, \$11,300,000, being all of the outstanding bonds issued under its Improvement Mortgage and the three-year note payable to The Missouri Pacific Railway Company, amounting to \$8,500,000. The Improvement Mortgage has been satisfied of record and cancelled, and the note has been likewise cancelled.

The same amount (\$11,300,000) of the outstanding Missouri Pacific Railway Company's First and Refunding Bonds were simultaneously surrendered, and the right to issue an additional \$13,700,000 of said Refunding Bonds against a like amount of Improvement Bonds, was cancelled, by the satisfaction of record of the Improvement Mortgage.

The St. Louis, Iron Mountain & Southern Railway Company has executed an indenture to Union Trust Company of New York and Benjamin F. Edwards, as Trustees, dated June 1st, 1913, supplemental to its First and Refunding Mortgage to the same Trustees, dated July 1st, 1912. This supplemental indenture provides, among other things, for the creation of a sinking fund, to be made up of one-third of the Company's net income (after deducting an amount sufficient to pay a dividend of 4 per cent upon its outstanding capital stock), which is to be paid into the sinking fund annually on and after September 30th, 1915, such amount, however, being limited to \$1,000,000 in any one year, which said sinking fund is to be used for the purchase for cancellation, or for the redemption of bonds at any time outstanding under said refunding mortgage and supplemental indenture.

Certain changes have been made in the collateral securing the three-year 5 per cent gold notes, due June 1st, 1914, in accordance with the provisions of the indenture securing them, and there is at present pledged for the security of these notes, of which \$24,976,000 are outstanding, the following collateral:

\$22,000,000 face value, St. Louis, Iron Mountain & Southern Railway Company 6 Per Cent Forty-Year Gold Bonds, Series "A" (non-convertible), due July 1st, 1952, secured by the first and refunding mortgage and indenture supplemental thereto;

1,070,000 par value (10,700 shares), St. Louis, Iron Mountain & Southern Railway Company Stock;

1,972,000 face value, The Missouri Pacific Railway Company First and Refunding Mortgage Fifty-Year 5 Per Cent Gold Bonds, Series "B" (non-convertible), due September 1st, 1959;

9,800,000 par value (98,000 shares), The Denver & Rio Grande Railroad Company Preferred Stock;

15,000,000 par value (150,000 shares), The Denver & Rio Grande Railroad Company Common Stock;

828,380 face value, The Texas & Pacific Railway Company 5 Per Cent Gold Note, due June 1st, 1914;

525,000 face value, Concordia Coal Company First Mortgage 5 Per Cent Bonds, due October 1st, 1945;

150,000 par value (1,500 shares), Baring Cross Bridge Company 7 Per Cent Stock;

125,000 par value (1,250 shares), Pueblo Stock Yards Company Stock;

1,000,000 par value (10,000 shares), Western Coal and Mining Company Stock.

## NEW LINES.

The line between Marianna and West Memphis, Ark. (42.9 miles), referred to in last year's report, was placed in operation February 1st, 1913.

The lines of railway of the  
Marion & Johnston City Railway Company..... 6.99 miles  
Marion & Harrisburg Railway Company..... 1.97 miles  
Johnston City Connecting Railway Company..... 2.05 miles

11.01 miles

located in the Southern Illinois Coal District, the entire capital stock of which was owned by the St. Louis, Iron Mountain & Southern Railway Company, were transferred to the latter by deed, thereby eliminating any necessity for continuing the separate corporate entity of each.

Detail of changes in mileage operated are recorded on page 51.

## EQUIPMENT.

The following new equipment was purchased or built at Company's shops, and taken into the accounts, at cost of \$65,046.80:

- 1 Wrecking Crane 120 tons capacity,
- 2 Clam Shell Locomotive Cranes 25 tons capacity,
- 1 Steam Shovel,
- 5 Snow Plows,
- 1 Lidgerwood Unloader,
- 2 Scale Test Cars,
- 2 Yard Cranes,
- 1 Caboose.

The purchase of additional equipment was authorized and ordered, but delivery not made at close of year, as follows:

- 7 Mountain Type Locomotives,
- 5 Pacific Type Locomotives,
- 5 Mikado Type Locomotives,
- 2 Pile Drivers,
- 1 Bridge Erecting Derrick Car.

Comparisons of inventory and capacity of equipment appear in statements on pages 46 and 47.

## ADDITIONS AND BETTERMENTS.

Except for right of way and station grounds and similar necessities, total amount involved approximately \$30,000, there were no realty acquisitions.

Cuts and Fills were widened to standard section on 650.54 miles, the major portion of it being essential in connection with necessary ballasting which was applied as follows:

Gravel .....	209.42 miles
Rock .....	.90 miles
Cinders and Slag.....	167.46 miles
Chatts .....	338.65 miles
Total .....	716.43 miles

It was not only expedient but necessary to continue this class of work urged as it has been by increases in traffic density. The amount thus expended, exclusive of maintenance charges, aggregated \$1,978,768.26.

Except for completion of the revision between Gorham and Bush, Ill., and a number of small raises of track on account of bridges or drainage, there were no expenditures for grade reductions or changes of line.

New 90-lb. section rail was laid on 261.82 miles in displacement of lighter sections.

Additional second tracks were constructed:	
West Side Junction to South Omaha.....	2.29 miles
West Side Junction to 29th Street, Omaha.....	2.59 miles
Total .....	4.88 miles

Sidings and spur tracks, and terminal yards were newly constructed or extended at a large number of points, increasing the track mileage 67.71 miles.

Fencing right of way has been continued and 481.8 miles completed during the year; in conjunction therewith 2,493 cattle guards were installed.

There were expended over \$56,000 in improvement and elimination of grade crossings, and installation of three interlocking plants.

Additional automatic block signals have been provided covering 9.73 track miles, and the necessary equipment has been added to telephone and telegraph lines to enable the extension of the Manual telephone block protection over 781.49 additional operated miles.

Mileage of telephone and telegraph circuits has been increased as follows:

Telegraph Circuits.....	471.34 miles
Telephone Train Dispatching.....	901.53 miles
Local Telephone.....	62.13 miles
Total .....	1,435.00 miles

New stations were constructed of Brick, 16; Frame, 14; and others re-modeled or extended at 16 points.

New water stations were established at Carona, Mont Ida, Lane and Greenleaf, Kans.; Nevada, Mo.; Dupo, Ill.; and Gurdon, Ark. A new 250 ton mechanical coaling station was completed at Bald Knob, Ark.

A substantial two-story hotel was erected at Bush, Ill., because of the absence of adequate accommodations for employees in the Coal District, and is being successfully operated under an arrangement with the Railroad Young Men's Christian Association.

Total expenditures for Additions and Betterments for the year aggregated \$4,213,387.03 and are listed under "Roads and Equipment" pages 28 and 29.

## OPERATIONS.

The revenues from freight, from passenger and all other operating sources each exceeded any previous record in the history of the property, the total operating revenues being \$62,155,506.14, representing an increase of 14.04 per cent over the previous year and equaling \$8,565.00 per mile of road operated (average).

The revenue from freight traffic increased \$6,233,913.52, or 15.78 per cent, and by reason of the longer average haul per ton, the accumulated ton mileage increased 18.23 per cent. The average haul this year was 243.17 miles, an increase of 5.11 miles.

The average revenue per ton per mile was but 8.07 mills, representing a decline of 2.06 per cent.

The tabulated statement on page 50 records the number of tons of each commodity carried, each group showing substantial increases. The groups contributing the greatest tonnage increases being products of mines, products of agriculture and products of forests.

The revenue from transportation of passengers was \$11,627,480.60, an increase of 9.05 per cent. The number of passengers carried one mile increased 8.42 per cent, while the average revenue per passenger, and the average revenue per passenger per mile (2.32 cents), remained substantially the same.

The operating expenses are given in detail and with comparisons on pages 42 and 43.

Federal action, in conjunction with local efforts, has not been sufficient to afford assurance against damage by high water in the lower Mississippi Valley. The properties suffered a repetition of the floods of the previous year, although to much less extent on portions of the lines, principally in Arkansas and Louisiana. This contributed to the increase of 6.91 per cent in the expenditures under Maintenance of Way and Structures, although primarily the excess charges went to the further upkeep and improvements of the physical property; all items of work in connection therewith having gratifyingly progressed. The total charges per mile of road aggregated more than \$1,276.00.

The charges to repairs and renewals of locomotives, passenger and freight train cars, were greatly increased, all classes of equipment requiring very heavy repairs or reconstruction, a large proportion of the excess over the previous year being incident to the increased volume of traffic.

When applied to the equipment owned as at the beginning of the year, the expenditures equalled per locomotive, \$3,436.93, per passenger train car, \$1,241.24 and per freight car, \$90.63. The result of these expenditures has been to decidedly raise the average condition throughout.

The two accounts of Maintenance of Way and Structures and Maintenance of Equipment, combined represent an outgo for upkeep of more

than \$19,000,000 and equal nearly 31 per cent of the total operating revenue.

Traffic expenses increased 4.94 per cent.

Transportation expenses exhibit an increase of 5.92 per cent, which affords gratification compared with the preceding year; the revenue ton mileage increased more than eighteen per cent, and passenger train mileage nearly six per cent, carrying an increase of over eight per cent in the number of passengers carried one mile. The revenue freight per car averaged 18.06 tons an increase of 6.86 per cent, and the average revenue tons per freight train mile were 373.29, an increase of 12.13 per cent.

General Expenses declined 2.75 per cent.

There were established 448 new industries adjacent to or on the right of way, and new sidings to meet industrial requirements were constructed to the number of 124.

The operations of the Land Department are recorded on page 55.

The Hospital Fund of the employees of the system, heretofore managed by the officers of the Company, was on November 1st, 1912, turned over to a Board of Hospital Service Managers, representing the employees, together with all funds and property then in possession of the Company.

Since the close of the fiscal year the item of Notes Payable of \$425,000 shown on the Missouri Pacific balance sheet page 19, has been reduced by the payment of \$250,000. The remaining \$175,000 represents a note given to Board of Hospital Service Managers, covering a credit to the Hospital Fund on the books of the Company, November 1st, 1912.

Similarly, the indebtedness of the St. Louis, Iron Mountain & Southern Ry. Co. to The Missouri Pacific Ry. Co. shown under Working Assets on page 18 and under Working Liabilities on page 25, has been reduced by the payment of \$1,550,000 on the sale of First and Refunding Mortgage bonds of the Iron Mountain Company held in its treasury.

With the exception of current obligations incidental to operation, the System is carrying no floating debt.

The anticipations of a year ago with respect to the operations of the property, have been quite fully realized. The transition from a deficit last year of approximately two millions of dollars to a "Net Income" credit of \$1,562,734, is but a corollary to the persistent and economic application of energy directed toward the further development of that recognized unit—the welfare of the public and the integrity of the carrier. As the curtailment, so also does the continuation, of this development largely rest with the peoples served by the Missouri Pacific System.

Ordinarily, the expression "density of traffic"—meaning in this instance the average number of revenue tons transported one mile per mile of operated railroad—conveys little, but to state that this measure of quantity increased 17.8 per cent over that obtaining last year, and 28½ per cent compared with two years ago, can not fail to impress both users of the road and the public in general, not only with the tremendous increased wear and tear which must be currently restored, but also and more particularly with the absolute necessity of making the way clearer for securing adequate funds, properly protected as an investment, so that the patent facility and service requirements of the growing communities may be competently met. Action—and action there must be—looking to the accomplishment of that end, constitutes good citizenship, and carries a Nation-wide influence in the common cause of our Country, and is an obligation from which no geographic section can exempt itself.

Wholly apart from and in addition to enormous payments for purchases, the System dispensed this last year in wages alone a sum in excess of \$29,000,000.00. It is obvious that the beneficiaries of such disbursement should be ardent progressors and defenders in the solution of all those complex factors which go to make for our mutual and inseparable success.

By order of the Board of Directors.

B. F. BUSH,  
President.

## THE MISSOURI PACIFIC RAILWAY COMPANY.

## PROFIT AND LOSS.

JUNE 30, 1913.

Credit Balance, June 30th, 1912.....	\$6,494,498.85
Credit Balance Transferred from Income Account .....	\$369,697.32
Credit on Road and Equipment Sold....	120.00
Delayed Income Credits .....	11,290.67
Miscellaneous Credits .....	18,768.05
	\$399,876.04
Less:	
Debt Discount Extinguished through Surplus .....	\$2,128.80
Loss on Retired Road and Equipment .....	178,175.06
Delayed Income Debits.....	14,391.29
Miscellaneous Debits .....	101,690.76
	296,385.91
	103,490.13
Credit Balance, June 30th, 1913.....	\$6,597,988.98

## ST. LOUIS, IRON MOUNTAIN &amp; SOUTHERN RAILWAY COMPANY.

## PROFIT AND LOSS.

JUNE 30, 1913.

Debit Balance, June 30th, 1912.....	\$341,908.16
Credit Balance Transferred from Income Account .....	\$1,193,036.56
Delayed Income Credit.....	334.72
Miscellaneous Credits .....	80,261.12
	\$1,273,632.40
Less:	
Debt Discount Extinguished through Surplus .....	\$287,170.00
Loss on Retired Road and Equipment .....	193,915.68
Delayed Income Debits.....	34,443.03
Miscellaneous Debits .....	10,904.40
	526,433.11
	747,199.29
Credit Balance, June 30th, 1913.....	\$405,291.13